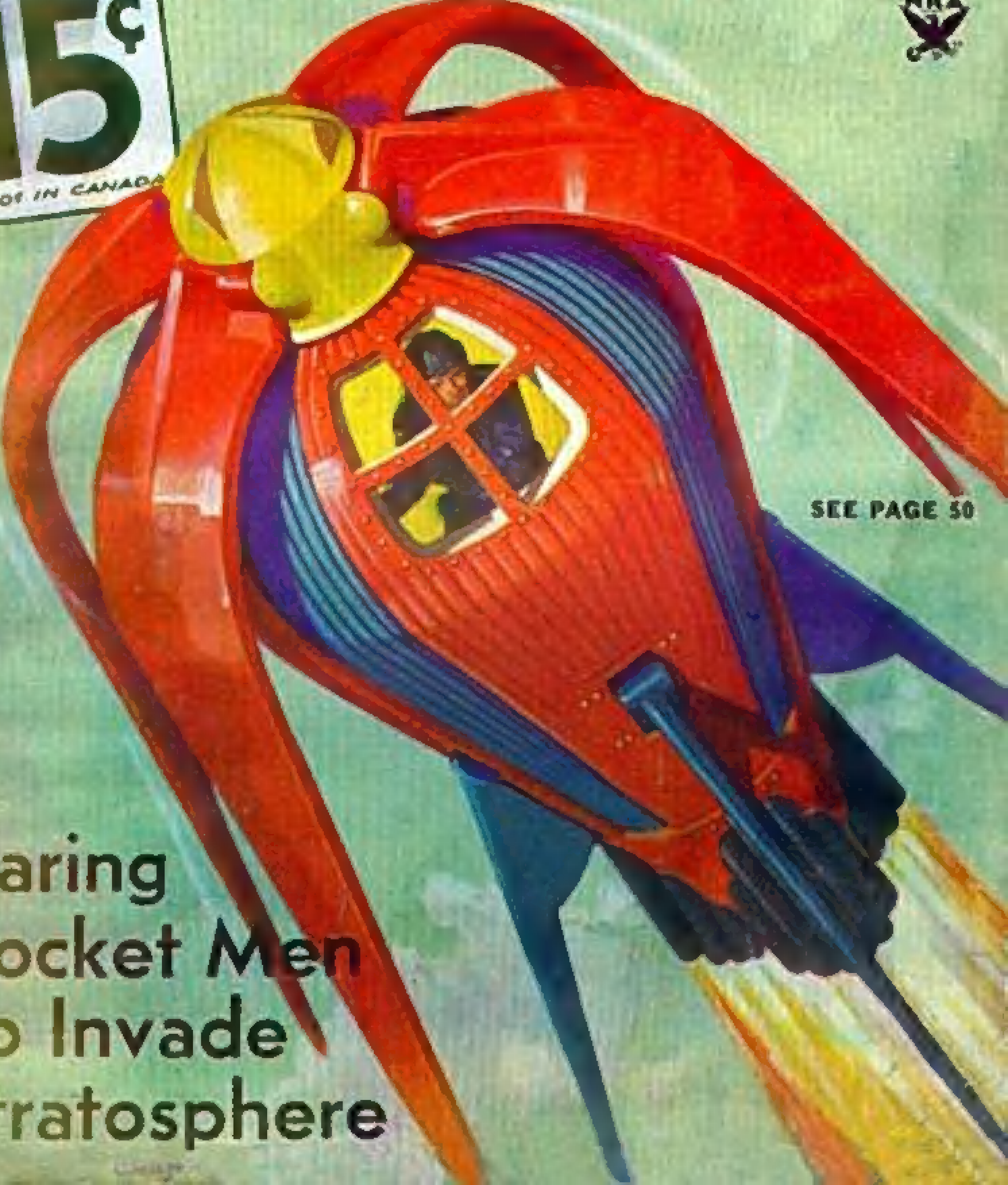
MAY

MODERN MECHANIX
AND INVENTIONS

NOW 15¢
20¢ IN CANADA



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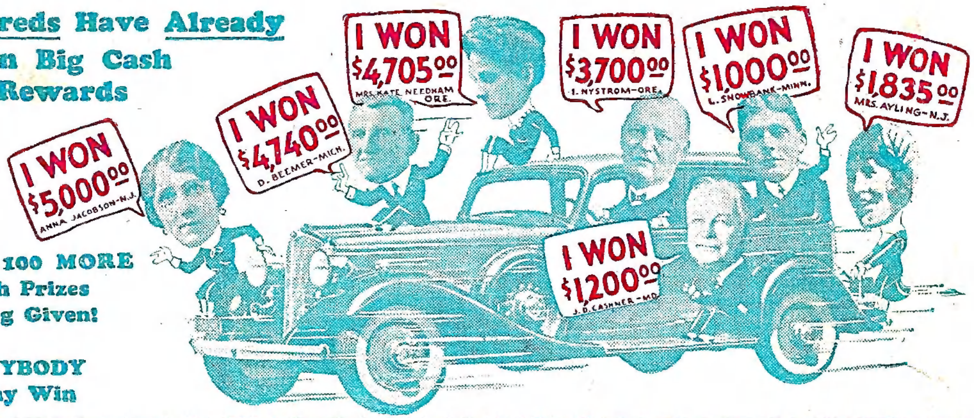
Daring Rocket Men To Invade Stratosphere

Hundreds Have Already
Won Big Cash Rewards

NOW—100 MORE Cash Prizes Being Given!

ANYBODY May Win


I WON $5,000.00 ANNA JACOBSON-N.J.
I WON $4,740.00 D. BEEMER-MICH.
I WON $4,705.00 MRS. KATE NEEDHAM ORE.
I WON $3,700.00 I. NYSTROM-ORE.
I WON $1,000.00 L. SNOWBANK-MINN.
I WON $1,835.00 MRS. AYLING-N.J.
I WON $1,200.00 J. D. CASHNER-MO.

Would YOU, TOO, Like to

Win $2,500.00

or Buick Sedan & $1,000.00?

DO YOU want money?—a small fortune?—$2,500.00 in *real* Cash? Here's your opportunity! And not one cent of your money is required now or ever to win it. This is our sensational new way to advertise. We want people everywhere talking about our company *quick*. So we are *giving away thousands* of Dollars—real fortunes—100 cash prizes totaling over $5,000.00—besides thousands of dollars in Extra cash rewards. *Everybody* can share in these cash rewards. Wouldn't you, too, like to win a brand new Buick Sedan and $1,000.00 (or $2,500.00 all cash)?

Can YOU Find 4 Dogs in Picture at Right?

Some are upside down. Some sidewise. Can you find 4 dogs? Mark the dogs you find, clip picture and mail quick. *Hundreds* of people have won thousands of dollars in cash rewards in other advertising campaigns conducted by men in this big company. Above are a few. Now comes *your* chance. Maybe this great opportunity sounds like a dream to you, but I'll be happy to send you the $2,500 or Buick and $1,000.00 the minute you win it.

Not a Penny of Your Money Needed

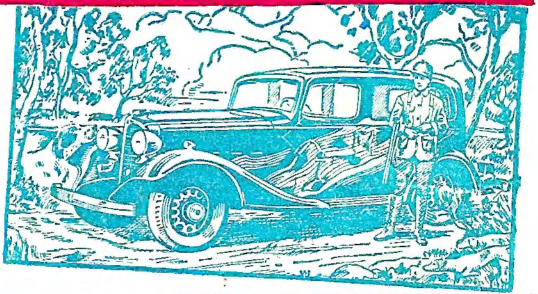
All these prizes are being given *outright* to winners. Not a penny of your money needed to buy *anything*. *Not* a lottery. No luck or skill needed. Nothing to write. Imagine the joy of receiving a letter from me with $2,500.00 in it! Oh, boy, what a thrill! Hurry—get started quick by finding 4 dogs. *Nothing* for you to lose.

You Are SURE to Win

a Cash Reward if You Do as I Ask

You are absolutely GUARANTEED to win a cash reward if you take an active part. But hurry! First active, first rewarded! Think of all the happiness $2,500.00 can bring you! We are reliable! I invite you to look us up through any credit agency, any bank in Des Moines, any business house, railroad, express company, magazine, newspaper. . . . We are well known national advertisers.

$10,000.00 REWARD We will pay $10,000.00 forfeit to any worthy charity if anyone can prove that we do not really give away all these thousands of dollars in prizes—or that all this prize money is not in the bank waiting to promptly pay every prize winner—or that we will not fulfill every guarantee we make. We are a big, responsible firm.



ALL PRIZE MONEY NOW IN BANK

All the thousands of dollars to pay every prize winner is now in the big, strong Bankers Trust Co. bank in Des Moines.

$1,000.00 EXTRA FOR PROMPTNESS

I will pay First Grand Prize winner $1,000.00 extra just for promptness—a Buick and $1,000.00 (or $2,500.00 if all cash is preferred). Do you want it? Then hurry. Not only *one* person, but *hundreds will win* cash rewards. In case of ties duplicate prizes will be given.

MAIL COUPON QUICK

Just mark the dogs you find, clip picture and mail quick with coupon below—or write on a penny post-card how many dogs you find. Don't send a cent. For replying I will tell you how you may share in thousands of dollars in EXTRA cash rewards and win $2,500.00, too. Answer today. Tell me which you desire to win—$2,500 all cash or Buick and $1,000.00?

Merrold Johnson,
Prize Mgr.,
Dept. 233,
Des Moines
Iowa

Merrold Johnson, Prize Manager,
Dept. 233, Des Moines, Iowa.

I have found 4 hunting dogs in your picture and I am anxious to win.

Name. . . . .

Address. . . . .

City. . . . . State. . . . . . .

(Mark in square which you would prefer to win.)

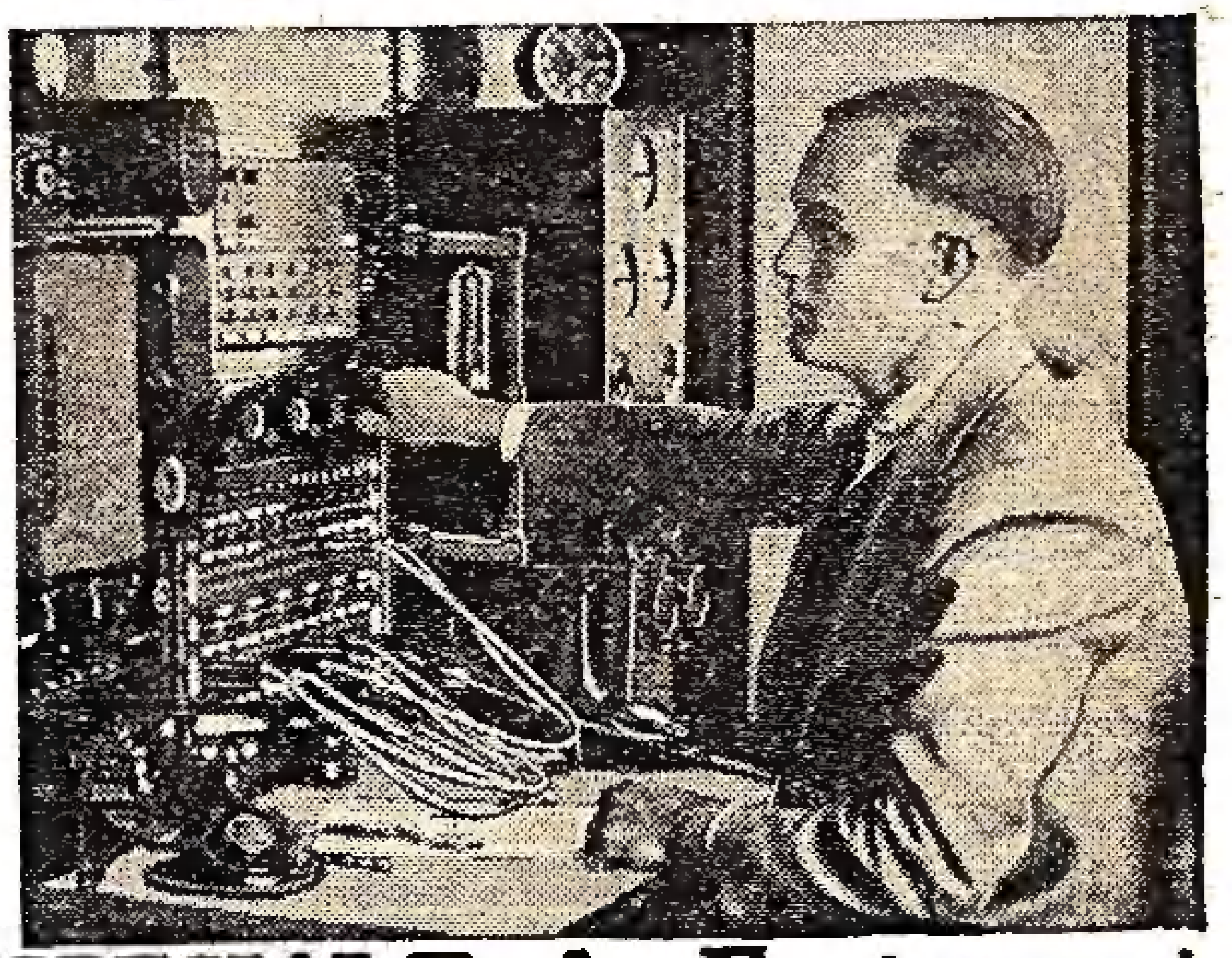
☐ Buick and $1,000.00, or ☐ $2,500.00 All Cash.

I will Train You at Home in your spare time to fill a GOOD JOB in Radio

Here's Proof

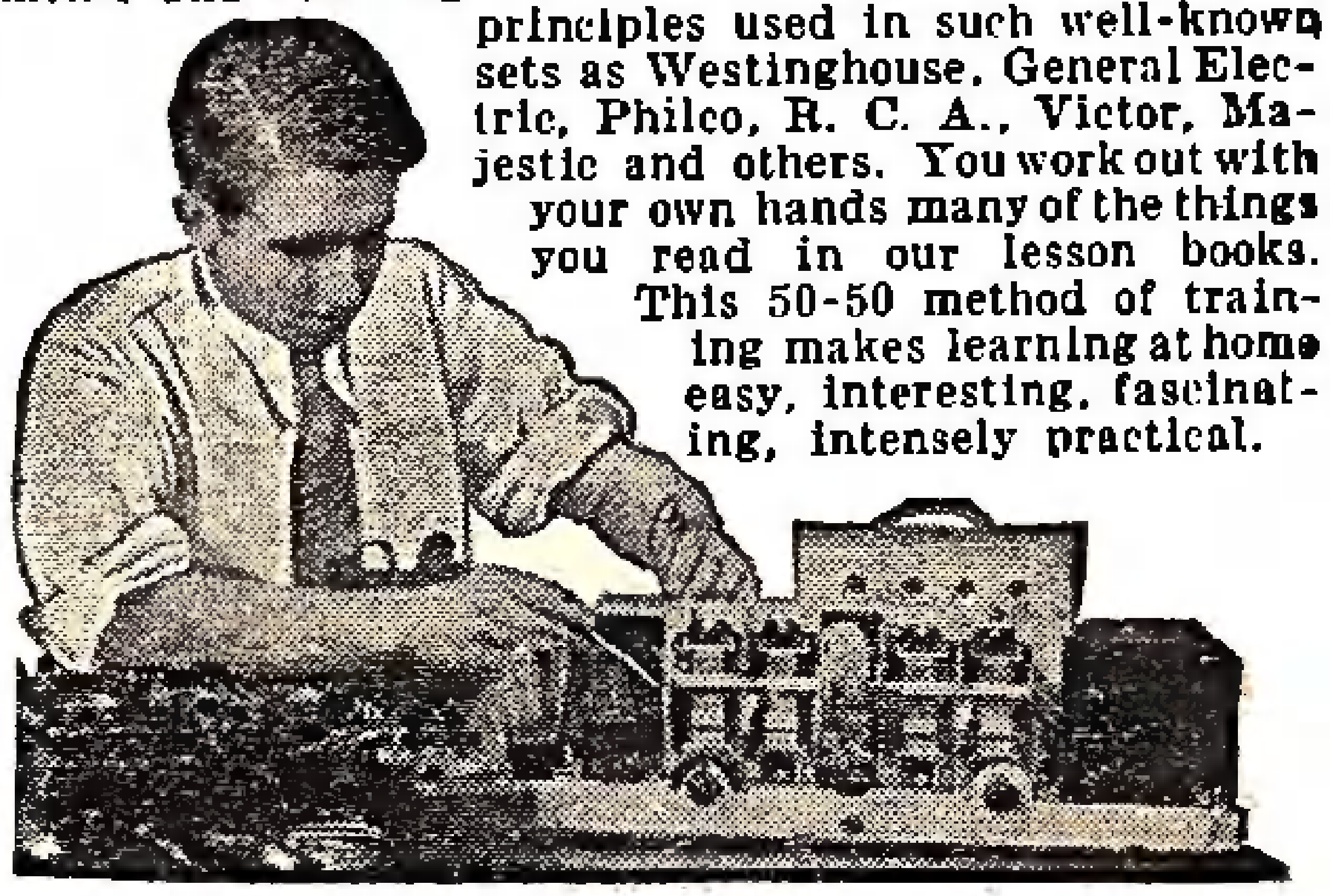
Get away from disagreeable jobs with no future. From skinny, little pay envelopes. From skimping along, just barely getting by, but not getting ahead. DON'T PUT UP WITH THEM ANY LONGER. Get into a field with a future. Act today to put yourself ahead. Mail the coupon for my free 64-page book that tells how you can train at home in your spare time to be a Radio Expert; about my Course that doubles and triples the pay of many who take it. MAIL THAT COUPON NOW and take the first step toward a real future.

Free Book Tells How Mail Card



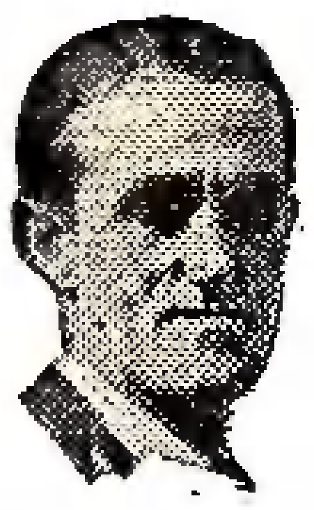
SPECIAL Radio Equipment for Broad Practical Experience *Given Without Extra Charge*

My Course is not all theory. I'll show you how to use my special Radio equipment for conducting experiments and building circuits which illustrate important principles used in such well-known sets as Westinghouse, General Electric, Philco, R. C. A., Victor, Majestic and others. You work out with your own hands many of the things you read in our lesson books. This 50-50 method of training makes learning at home easy, interesting, fascinating, intensely practical.



Service Manager Earns $200 Month

"As Radio Service Manager for Sterchi's four Nashville Stores, my earnings are around $200 a month. My N.R.I. training enables me to keep our customers satisfied."
E. H. LEFTWICH,
Sterchi Bros. Stores,
Inc., Nashville, Tenn.



$120 a Month in Spare Time

"I'm servicing from 3 to 5 sets daily in spare time, and average $120 a month from my Radio work. I still hold my regular day job. I owe my success to N. R. I."
A. E. FARMER,
1012 Denison St.,
Muskogee, Okla.

Owes a Lot to N. R. I.

"After finishing my tenth lesson, I started on my first job. After that, jobs came rolling in and I found myself with a surplus of money with which to continue paying for my Course. My first year's record was 108 Radio jobs. I have cleared $2,305 to date in spare time."
JOHN HEARL,
66-53 Jary Ave.,
Maspeth, L. I., N. Y.

Real Opportunities Ahead in Radio for Trained Men

It's hard to find a field with more opportunity awaiting the trained man. Why in 1932—the worst year of the depression—the Radio Industry sold $200,000,000 worth of sets and parts! Manufacturers alone employed nearly 100,000 people! About 300,000 people worked in the industry. 1932 broadcasting revenue was the biggest in history. It's a gigantic business, even in the worst business years! And look what's ahead! Millions of sets becoming obsolete annually. 17,000,000 sets in operation that need servicing from time to time! Over 600 great broadcasting stations furnishing entertainment and news to 100,000,000 people. These figures are so big that they are hard to grasp! Yet, they are all true! Here is a new industry that has grown into a commercial giant. No wonder great business leaders predict a brilliant future for this great and growing business.

Get Into This Field With a Future

There's opportunity for you in Radio. Its future is certain. Television, short wave, police Radio, automobile Radio, loud speaker systems, aircraft Radio—in every branch, developments and improvements are taking place. Here is a real future for thousands and thousands of men who really know Radio. Get the training that opens the road to good pay, and success! Send me the coupon now, and get full particulars on how easy and interesting I make learning at home. Read the letters from graduates who are today earning real money in this fascinating industry.

Many Make $5, $10, $15 a Week Extra in Spare Time Almost at Once

My book also tells how many of my students made $5, $10, $15 a week extra in spare time, soon after they enrolled. I give you plans and ideas that have made good spare time money—$200 to $1,000 a year—for hundreds of fellows. My Course is famous as "the one that pays for itself."

Money Back if Not Satisfied

I am so sure that N.R.I. can train you satisfactorily that I will agree in writing to refund every penny of your tuition if you are not satisfied with my Lessons and Instruction Service upon completion. You'll get a copy of this Agreement with my book.

64-page Book of Information Free

Get your copy today. It's free to any ambitious fellow over 15 years old. It tells you about Radio's spare time and full time job opportunities; it tells you all about my Course; what others who have taken it are doing and making. Find out what Radio offers YOU without the slightest obligation. Mail the coupon now in an envelope, or paste it on a 1c postcard.

J. E. SMITH, President
National Radio Institute, Dept. 4EH
Washington, D. C.

SAMPLE LESSON FREE

Take advantage of this offer. Mail the coupon RIGHT NOW, and I'll send you FREE a Sample Lesson that only my students have received in the past. This fascinating book, "A Bird's-Eye View of Radio," is just packed and jammed with information about this growing industry. The reason I am willing to send it to you is to PROVE that my Course is simple, easy to understand, and enjoyable to study. I want to SHOW YOU that I can train you, just as I have ALREADY trained thousands of men. Many of them with not even a grammar school education, and no Radio or technical experience, have become Radio experts, and now earn two or three times their former pay. Mail the coupon NOW.

I have doubled and tripled the salaries of many. Find out about this tested way to BIGGER PAY

RICH REWARDS IN RADIO

Get a Job with a Future

FILL OUT AND MAIL THIS COUPON TODAY

J. E. SMITH, President
National Radio Institute, Dept. 4EH
Washington, D. C.

I want to take advantage of your special offer. Send your free book "Rich Rewards in Radio" and a free sample lesson. This does not obligate me.

NAME..

ADDRESS..

CITY........................STATE......."R"

The Famous Course That Pays For Itself

PRICE 15 CENTS
(20 CENTS IN CANADA)

MAY
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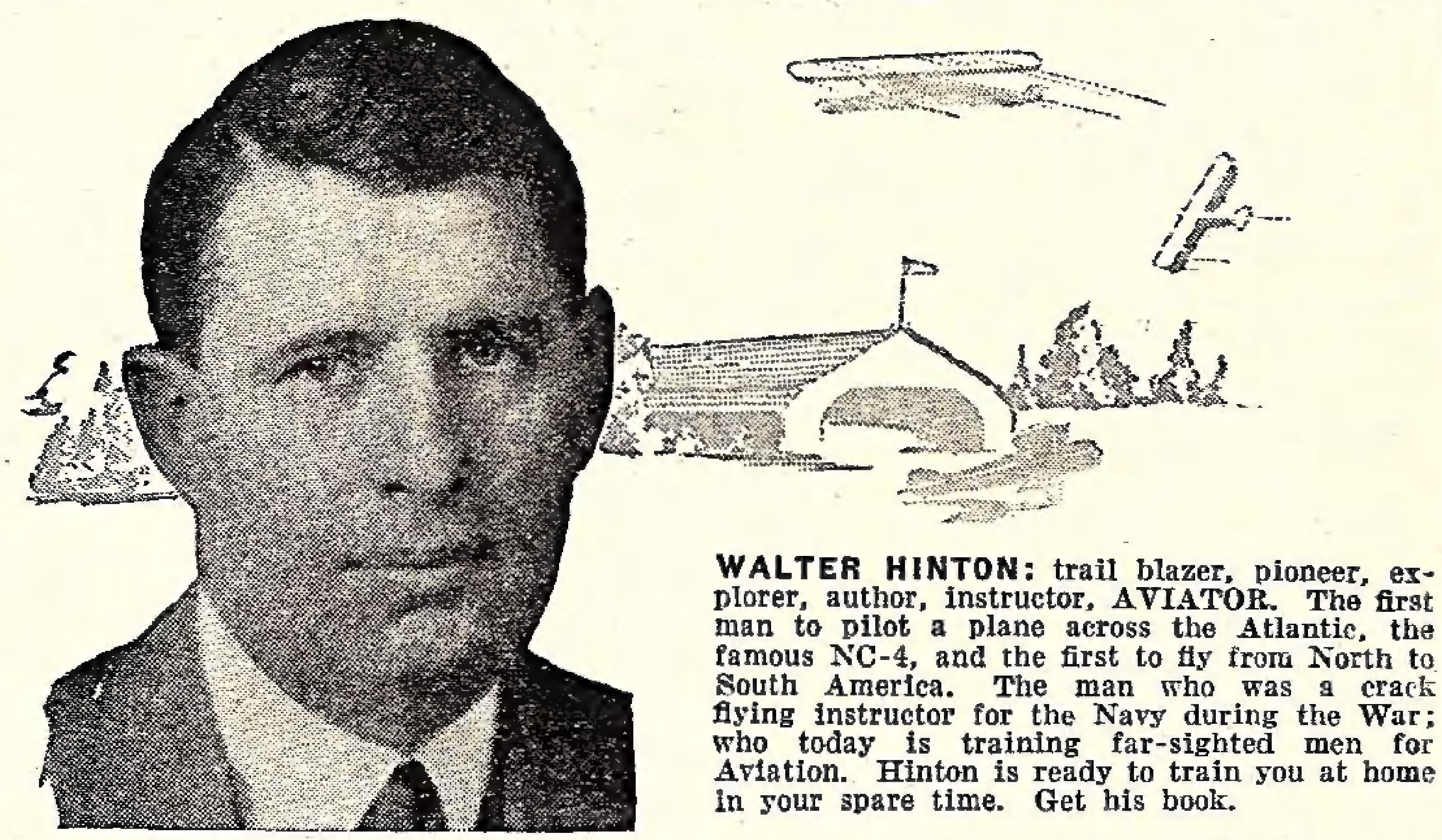
Prepare Quickly at Home in Spare Time

FOR A

Good Pay Job

IN THE

Fast-Growing AVIATION INDUSTRY



WALTER HINTON: trail blazer, pioneer, explorer, author, instructor, AVIATOR. The first man to pilot a plane across the Atlantic, the famous NC-4, and the first to fly from North to South America. The man who was a crack flying instructor for the Navy during the War; who today is training far-sighted men for Aviation. Hinton is ready to train you at home in your spare time. Get his book.

My famous course trains you right in your own home—gets you ready for one of the good ground jobs—or cuts many weeks and many dollars from flight instructions. Send for my big free book today.

Don't sit back and envy the men who are in the midst of the romance, adventure and fascination of Aviation. YOU DON'T HAVE TO. For right in your own home, in your spare time, I'll give you the training you need to get started in this growing, well-paid industry. Get my free book. It tells *all* the facts.

Many Make $40, $60, $75 a Week

Through the amazingly simple method I have worked out, I can train you at home to fill many well-paid jobs in Aviation. Naturally, before you can fly, you have to take additional instruction in a plane. Even on that instruction I save you time and money. But when you graduate from my course you have the necessary foundation to fill any one of the many interesting, well-paid ground jobs. Many of my graduates quickly get into jobs paying $40, $60 to $75 a week. Others, with the additional low cost flying instruction I arrange for, become pilots at $300 a month or better.

Aviation Is Growing Fast

Get into Aviation now—when you are still getting in on the ground floor of a new industry—when you have a chance to forge ahead without having to displace lots of older men. Aviation is a young man's industry, where young men earn real money. The President of the biggest air line in the World is only 35 years old. Most famous pilots are in their early thirties, or even younger. It is a young man's industry, which means that there are plenty of opportunities to forge ahead. But just because it is run by young men, don't get the idea that Aviation is a small business. Millions are being spent yearly to develop and improve airways and planes. Thousands of men earn good livings from the business. And many, many thousands will enter it in the future. It is a great and growing industry, this Aviation, an industry that still brings romance, excitement, thrills—even while it is bringing big opportunities and good pay.

Here are just a few of the many well-paid jobs in the fast growing Aviation Industry:

ON THE GROUND

- Airport Superintendent
- Instrument Specialist
- Electrician
- Shop Foreman
- Hangar Crew Chief
- Traffic Manager
- Purchasing Agent
- Aerial Mail Clerk
- Motor Expert
- Radio Operator
- Airplane Mechanic
- Field Work

IN THE AIR

- Air Express Agent
- Air Mail Pilot
- Aerial Photography
- Airport Manager
- Test Pilot
- Aerial Passenger Agent
- Private Piloting
- Weather Observer
- Flight Instructor
- Commercial Pilot
- Field Manager
- Transport Pilot

I Have Helped Secure Jobs for Many of My Graduates

Due to my widespread connections with aviators, plane manufacturers, airport managers, etc., I am in an especially favorable position to locate jobs for trained men. My Aviation friends know that Hinton-trained men are well qualified to fill any job for which I recommend them.

Send For My Free Book Now

Now is the time to act. Don't sit content with a humdrum job with no future. Act now—to get yourself into Aviation—the industry that is slated to grow into a giant business in the next few years. Get into Aviation. Study at home in your spare time for a well-paid job with a real future. Mail the coupon for my free book today.

Walter Hinton, Pres.
Aviation Institute
Washington, D. C.

FREE FLIGHT

"Give her the gun!" You're off! Yes siree, as soon as you complete my course, I arrange a free flight for you at an accredited air field. It doesn't cost you a penny. It is my graduation present to you.

These Men Made Good With My Training

$75 a Week as Instructor

Robt. N. Dobbins, a Hinton graduate, writes: "I cannot thank you enough for the assistance you gave me in getting my present position. Last week they promoted me to Chief Instructor, at a big salary increase."

Now District Traffic Agent

"When I finished your course I became connected with T.A.T. and am happy to state that promotion has come very rapidly. I shall always be grateful for your interest and cooperation." C. E. McCollum, District Traffic Agent, T.A.T.—Maddux Air Lines.

Mail Now for Facts

Mr. Walter Hinton, President 822-R
Aviation Institute of U. S. A., Inc.
1115 Connecticut Avenue, Washington, D. C.

Please send me a Free copy of your book, "Wings of Opportunity," telling all about my opportunities in Aviation, how you will train me at home for them.

Wings of Opportunity

Name ....
(Print clearly)

Address .... Age....

City .... State......

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New York Editor

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Hunting and Fishing Editor

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Nationally Known Radio Expert

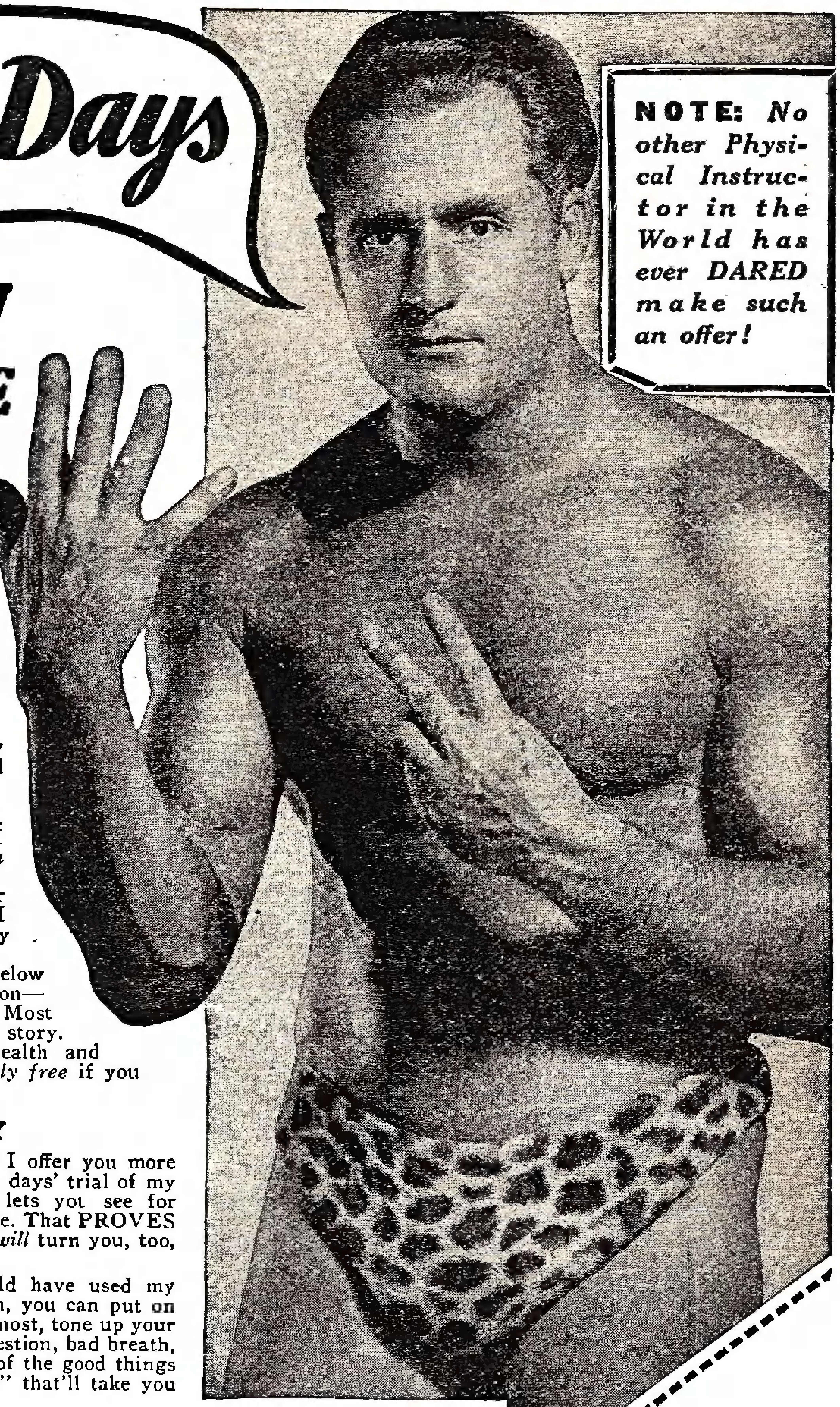
S. S. Rabl
Seaplane Designer and Naval Architect

Ray F. Kuns
Principal, Cincinnati Automotive Trade School

Just 7 Days

....that's all I need to PROVE I can make You a NEW MAN!

by Charles Atlas



NOTE: *No other Physical Instructor in the World has ever DARED make such an offer!*

Holder of the title:
"The World's Most Perfectly Developed Man"
Won in open competition in the only National and International contests held during the past 15 years

ONE week! That's all the time I need. In 7 days I'll give you proof that I can make you over into a *new man of vitality* and *power.*

I'll do for you exactly what I did for myself. I was once a 97-pound weakling. I was sickly, only half alive. I had a flabby namby-pamby body.

How I changed myself from this "below average" physique into the man who won—against all comers—the title of "World's Most Perfectly Developed Man" is an absorbing story. It is told in my book, "Everlasting Health and Strength," which I will send you *absolutely free* if you fill in and mail the coupon below.

It's Easy MY WAY

Big *claims* mean nothing! That is why I offer you more than *promises.* That is why I offer you a 7 days' trial of my famous method, *Dynamic-Tension.* That lets you see for yourself that I back up every promise I make. That PROVES beyond a flicker of a doubt that I *can* and *will* turn you, too, into a vital, powerful NEW MAN.

Thousands of fellows all over the world have used my method—and now you can, too. Like them, you can put on firm layers of muscle where you need them most, tone up your whole system, banish constipation, poor digestion, bad breath, pimples and other conditions that rob you of the good things and good times of life, and get the "drive" that'll take you to the top of the ladder.

I've Got NO USE for Apparatus

I haven't any use for tricky weights or springs and machines that may strain your heart and other vital organs. There's nothing unnatural or artificial about this method of mine. And I don't dose you or doctor you. *Dynamic-Tension* is all I need. It's the natural, tested method for developing real men inside and out. It distributes added pounds of powerful muscles over your body, gets rid of minor ailments and surplus fat, and gives you the vitality, strength and pep that win you the admiration of every woman and the respect of any man.

Everlasting Health and Strength

FREE BOOK

Gamble a stamp today. Mail coupon for free copy of my new book, "Everlasting Health and Strength." It shows you from actual photos how I have developed my pupils to my own perfectly balanced proportions. Where shall I send your copy? Write your name and address plainly on the coupon. Mail it today to me personally.!

Send for YOUR Copy of MY FREE BOOK

Don't be held back by a below-par body! Now you can easily and quickly make this new man of yourself! Do what my thousands of other pupils did —send for a free copy of my illustrated book, "Everlasting Health and Strength." Learn how I built myself up from a weak, no-muscle, always-tired "runt" to winner of the title, "The World's Most Perfectly Developed Man." Gamble a stamp to mail my coupon—to learn how YOU can win the biggest prize in life—a handsome, healthy, husky body. Address CHARLES ATLAS, Dept. 6-E, 133 E. 23rd St., New York, N. Y.

CHARLES ATLAS
Dept. 6-E
133 East 23rd Street,
New York, N. Y.

I want proof that *Dynamic-Tension* will make a New Man of me—give me a healthy, husky body and big muscle development. Send free book, "Everlasting Health and Strength."

Name ....
(Please print or write plainly)

Address ....

City .... State ....

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New Quick Relief Works Faster—

WHAT A HEADACHE!

•

Medical authorities discover new scientific facts about cause and relief of pain—new formula stops pain by relaxation—quickly—safely—scientifically

•

PHYSICIANS now say that most Headaches, and other severe pains are caused by (1) Acid Stomach or (2) Nervous Tension.

MODERN DOCTORS prefer HEXIN—an amazing new scientific formula—because it is *alkaline* and because it relieves pressure on nerve ends (the cause of pain) by *relaxing* tense muscles (the cause of this pressure). Users say they are getting relief with unheard-of speed.

BECAUSE HEXIN IS ALKALINE, it does not upset the stomach as acid tablets do. No druggy after-effects either. Just lightning-quick relief.

GIVE US A PAIN COMBATANT—mothers asked—that our children can take with safety. Give us a relief for pain and fever that is milder and better adapted to the delicate systems of children than ordinary tablets—so strong and so acid*.

SO HEXIN—an alkaline formula—was originally developed for children. Its action had to be gentle and safe. What's mild enough for your child is better for you. But don't be misled about the effectiveness of HEXIN for adult use. The action of HEXIN is mild but RELIEF IS IMMEDIATE.

HEXIN
HEXIN
HEXIN

Modern Druggists Prefer HEXIN

Buy a box of HEXIN today. If your druggist should not have it on hand, insist that he order it. You can buy HEXIN in convenient tins containing 12 tablets and in economical bottles of 50 and 100 tablets. Don't let your druggist give you anything but HEXIN. Nothing else is "just as good".

IN TRYING TO BREAK UP A COLD, do not add acid* tablets to an already acid stomach. HEXIN relieves colds by striking at the cause. Most people find that 1 HEXIN tablet every hour until 6 or 7 have been taken keeps a cold from starting or greatly relieves one that has started.

BUY HEXIN at any modern drug store. Take 2 tablets with water. At once, nerves start to relax. At once, HEXIN starts to combat acidity. Before you realize it, you are freed from those two *invisible competitors—pain and discomfort.*

MAKE the only test that counts. Try HEXIN yourself at our expense. Mail the coupon now. You'll never know what quick relief is till you try HEXIN.

*HEXIN is *ALKALINE* (non-acid).

HEXIN, INC., 8 South Michigan Ave., Chicago, Ill.
Please mail me a generous free sample of HEXIN. MM1634
Name..............................
Address..............................
City.............................. *State*..............

YOU CAN REPEAT ALMOST EVERY EXPERIENCE IN LIFE

—EXCEPT

life - itself

★

TODAY is life. Tomorrow is a hope. Yesterday is a dream. Nothing is so dead as a day that has passed. Only the trailing clouds of memory remain.

One *today* upon another *today*—how quickly a decade is built! Youth approaches manhood in high heart, embraces maturity as the period of his conquest, then "remembers with a sigh the days that are no more."

So life goes—like that. NOW is the only opportunity. NOW is the moment of success. NOW men decide—NOW men win or fail.

Are you one of the men who are wondering today what will happen to them tomorrow? Then remember this: *If you take care of today, tomorrow will take care of itself.* And one of the most important safeguards you can take is to be certain your *training* is modern . . . that you are adequately equipped to master the problems of 1934. Today, in almost every line of human endeavor, ambitious men are modernizing their training by spare-time study of International Correspondence Schools Courses. Their action is a guide to you—and NOW is the time to act! Complete information on any subject in which you are interested will be sent without cost or obligation. The coupon is for your convenience. Return it today.

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"The Universal University" BOX 2316-W, SCRANTON, PENNA.

★ Without cost or obligation, please send me a copy of your booklet, "Who Wins and Why," and full particulars about the subject *before* which I have marked X: ★

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☐ Electric Lighting
☐ Welding, Electric and Gas
☐ Reading Shop Blueprints
☐ Telegraph Engineer
☐ Telephone Work
☐ Mechanical Engineer
☐ Mechanical Draftsman
☐ Machinist ☐ Toolmaker
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☐ Heat Treatment of Metals
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☐ Plumbing ☐ Steam Fitting
☐ Heating ☐ Ventilation
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Name..............................*Age*..............*Address*..............................

City..............................*State*..............................*Occupation*..............................

If you reside in Canada, send this coupon to the International Correspondence Schools Canadian, Limited, Montreal, Canada

SHARPEN LAWNMOWERS AND EARN GOOD MONEY

Make $30 to $40 a Week in your Spare Time

Build Your Own Profitable Business

Anyone who wants to make good money either in his spare time or full time can do so by sharpening lawnmowers on the IDEAL Lawnmower Sharpener. Many men have made as high as $50 a week in their spare time alone. Most men will average around $30 to $40 a week. J. B. VanDien, Ridgewood, N. J., writes: "Some weeks last summer I earned $40.00 a week with my Ideal Sharpener just as a side line." H. Greenlaw, Fond du Lac, Wis., writes: "During May I sharpened over 200 mowers at $1.00 each." Niles C. Race, Rochester, N. Y., writes: "I have sharpened 785 mowers at $1.00 each."

The Ideal Lawnmower Sharpener

Makes old, dull lawnmowers cut like new. It uses the correct principle of **grinding** the blades on a **grinding wheel**—the FACTORY method—and the method we have used for 30 years. This produces the proper bevel or clearance and is the only way old, dull lawnmowers can be perfectly sharpened. Mowers run easier—stay sharp longer—customers come back year after year.

No Experience Necessary

No experience is required. Start right at home. Attach the Ideal to your lamp socket. Blades are automatically ground to fit the cutter bar without taking lawnmower apart. You can sharpen any make of lawnmower in 15 to 20 minutes—you get **$1.00 to $1.50**, depending on size and condition of mowers. New attachments also grind skates, grass shears, hedge shears, sickles, scythes, axes, gum saws, etc.

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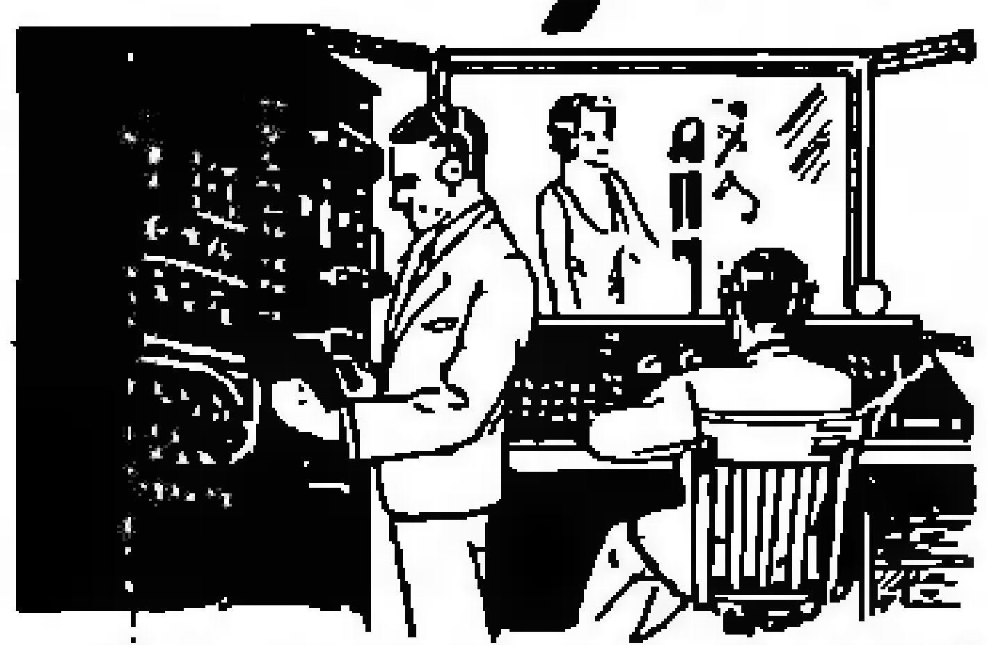
GOOD JOBS



Learn RADIO·TELEVISION ELECTRICITY·TALKING PICTURES

Times are getting better. Trained men are getting jobs. National will quickly train you to qualify for good jobs in all branches of radio, television, talking pictures, broadcasting, operating and general electricity. Thorough, practical training. Over $100,000 in modern equipment. National graduates in demand. Regardless of age or education you can learn profitable trades in a few months. Shop and studio practice.

QUALIFY AS A

- Radio Repair Man
- Television Expert
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- Station Technician
- Sound Expert
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- Broadcaster
- Electrician
- and many other jobs

EARN ROOM AND BOARD WHILE LEARNING

75% of our students earn living expenses while receiving training. We help you get a job. For limited time will allow your coach railroad fare to Los Angeles.

TRAIN IN LOS ANGELES

This is the Ideal City. Center of Greatest Activity in Radio, Talking Picture and Electricity. 30,000 successful graduates. School established 29 years. Send for free descriptive book and enrollment details.

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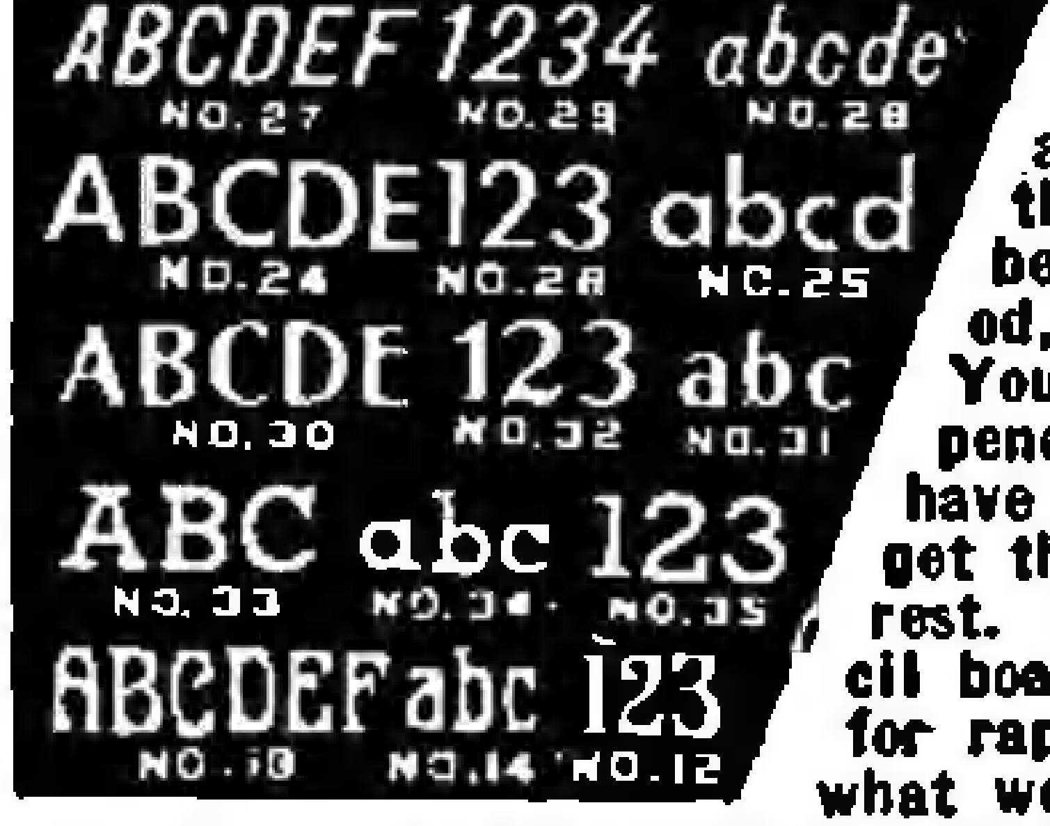
PAINT SIGNS

VERY SIMPLE AND EASY WITH LETTER PATTERNS! NO LESSONS OR EXPERIENCE REQUIRED!



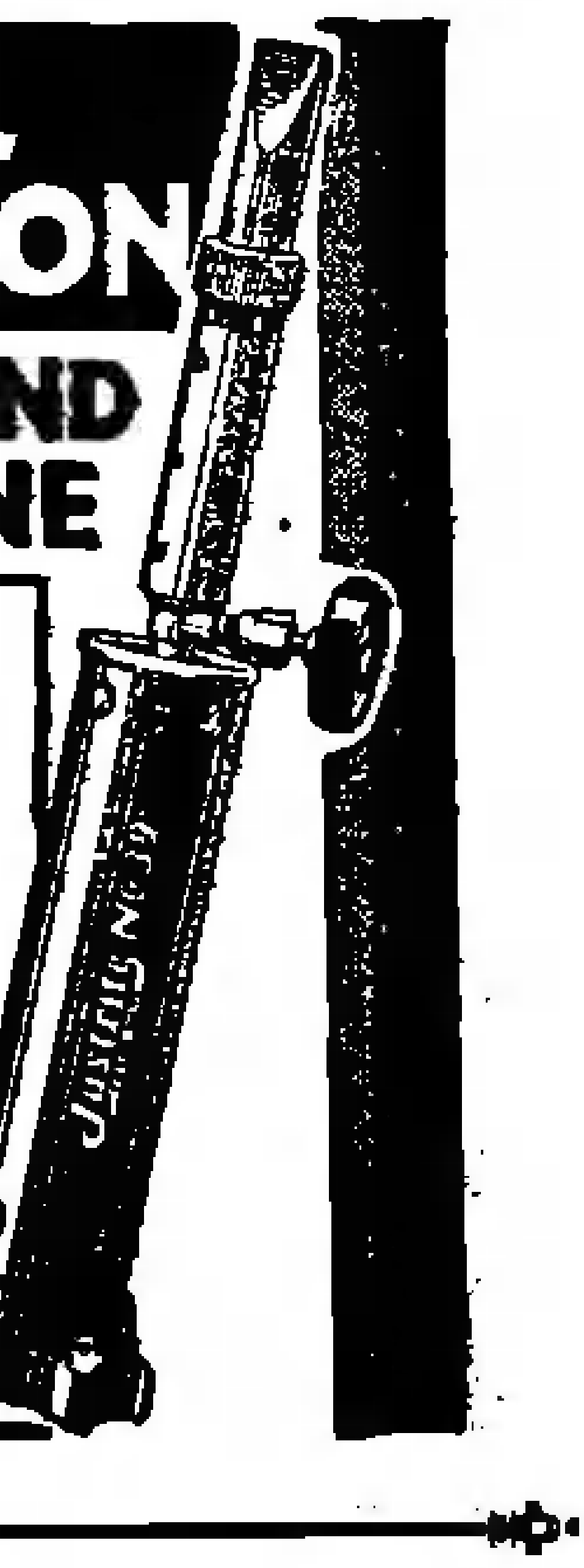
You can paint neat, appealing and attractive signs right now, even though you have never handled a brush before. This is a most practical method, which requires no lessons whatever. You merely trace around letters with pencil, fill in with color and there you have the splendid completed sign. Merely get the patterns. You can easily do the rest. Each letter is cut from durable stencil board with smooth edges, which allows for rapid outlining. Try it now, and see what wonderful work you can do promptly.

PRICE per ALPHABET OF 26 LETTERS: 1½ in., 60c.; 2 in., 70c.; 3 in., 85c.; 4 in., $1.10; 6 in., $1.75; 8 in., $2.50; 10 in., $3.25. Lower Case or small letters made to match capitals up to 4 inches, same price as capitals. **PRICE per SET of 10 NUMERALS:** 1½ in., 25c.; 2 in., 30c.; 3 in., 35c.; 4 in., 45c.; 6 in., 70c.; 8 in., $1.00; 10 in., $1.25. Orders filled promptly and postpaid. State number and size wanted. Complete list of other styles sent with order. Real opportunity awaits you here.

JOHN F. RAHN A2120-22 Neva Ave. Chicago, Ill.

WONDERFUL NEW INVENTION

SOLDERING IRON AND BLOW TORCH IN ONE


JUSTRITE No.

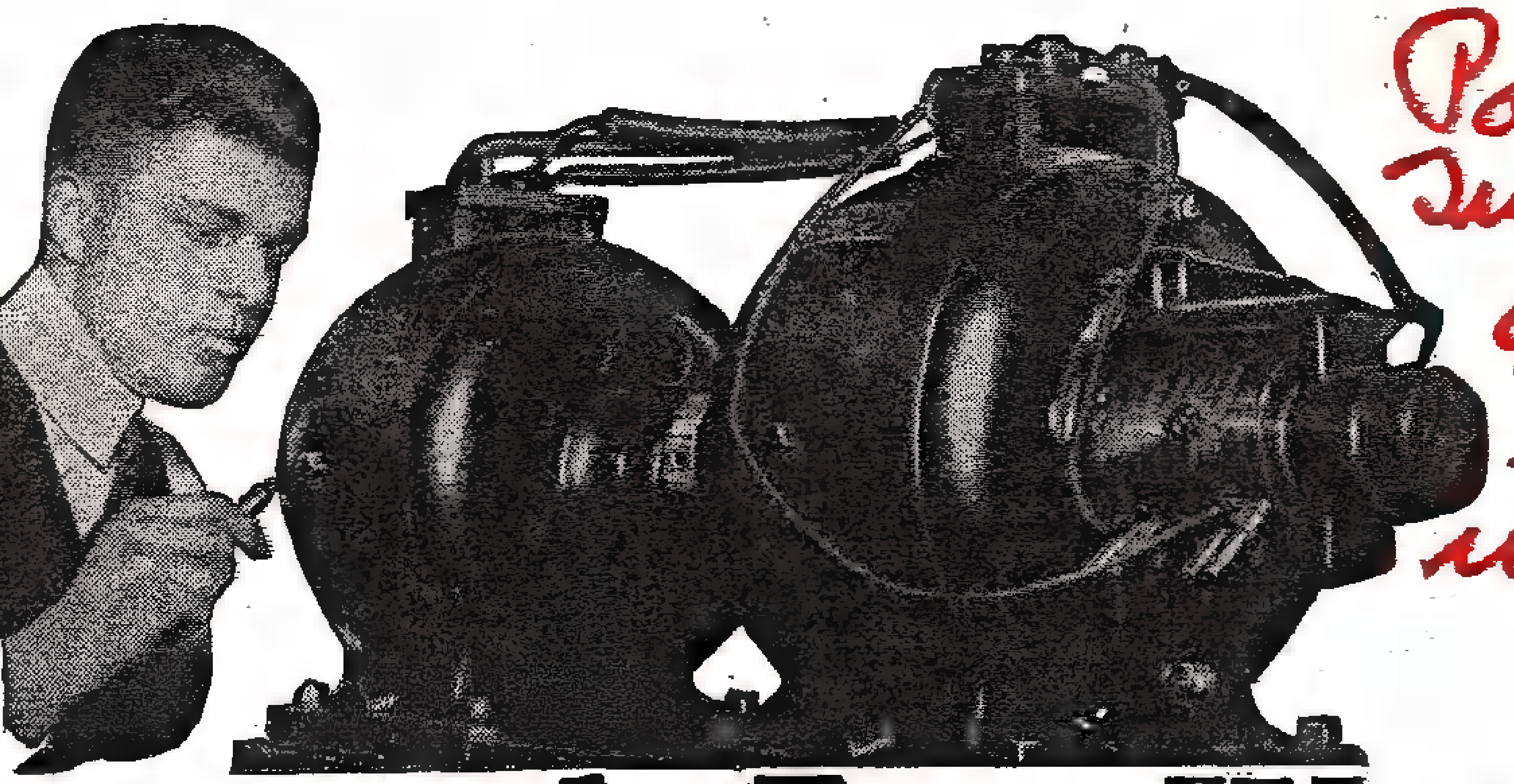
Pays for itself in one job! Needs no pump or pressure system—no stove—no charcoal—no separate blow torch. Burns an hour at less than ¼ cent for gasoline.

AGENTS' OFFER

Write for Special Offer to agents. The Justrite is an ideal proposition for either main line or side line—full time or spare time.

JUSTRITE MFG. CO.,
2047 Southport Avenue,
Chicago, Ill.

Get your Train-ing now



Pay tuition after grad-uation.

Amazingly Easy Way to get into ELECTRICITY

Don't spend your life never sure of a job and at dull uninteresting work. Now . . . and forever . . . say good-bye to that uninteresting, unsteady low pay job. LET ME SHOW YOU HOW TO PREPARE FOR POSITIONS THAT LEAD TO $50.00 A WEEK AND UP IN ELECTRICITY—NOT by book study, but by an amazing way to teach RIGHT HERE IN THE COYNE SHOPS IN CHICAGO that makes you a practical trained man in 90 days! THEN YOU CAN PAY ME AFTER GRADUATION IN EASY MONTHLY PAYMENTS!

Learn By Doing In 90 Days

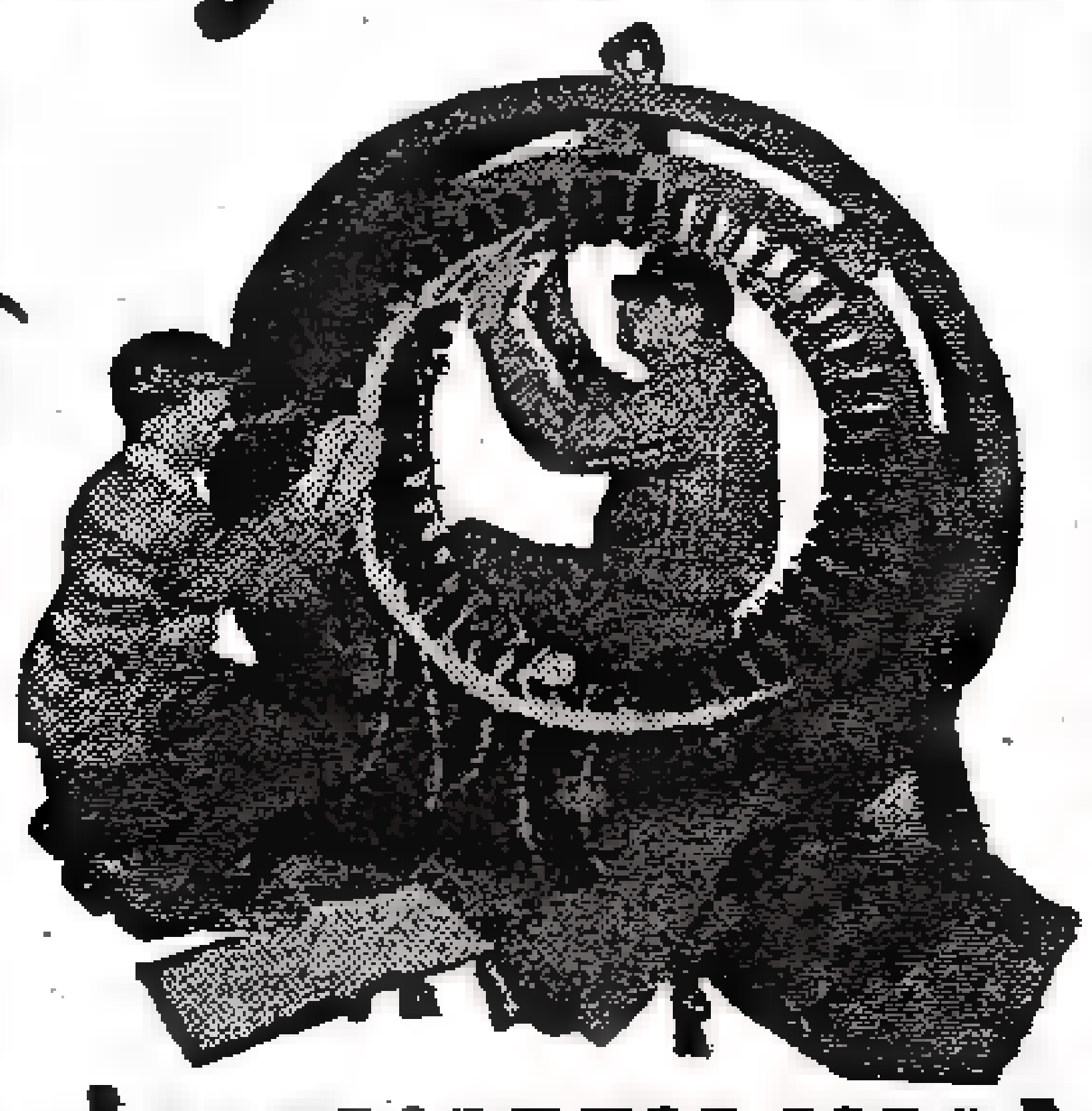
Lack of experience—age, or advanced education bars no one. I don't care if you don't know an armature from an air brake—I don't expect you to! It makes no difference! Don't let lack of money stop you. Most of the men at Coyne have no more money than you have. That's why I have worked out my offers.

Many Earn While Learning

If you need part-time work to help pay your living expenses and will tell me your problems I may be able to help you as I have thousands of others. Then, in 12 brief weeks, in the great roaring shops of Coyne, I train you as you never dreamed you could be trained. . . on one of the greatest outlays of electrical apparatus ever assembled. . . real dynamos, engines, power plants, autos, switchboards, transmitting stations. . . everything from doorbells to farm power and lighting. . . full-sized. . . in full operation every day!

TRAINING by Actual Work

No dull books, no baffling charts; no classes, you get individual training . . . all real actual work with only the theory you will need. Building real batteries. . . winding real armatures, operating real motors, dynamos and generators, wiring houses, etc. That's a glimpse of how we help to make you a master electrician, and fit you to qualify for jobs leading to the biggest pay.



PREPARE FOR JOBS LIKE THESE

Here are a few of hundreds of positions in the electrical field. Our free employment bureau gives you life-time employment service.

Armature Expert
Substation Operator
Auto Electrician
Inventor
Maintenance Engineer
Service Station Owner
Radio Expert

Jobs—Pay—Future

"Two weeks after graduation I received a splendid job. The main consideration given my application was that I was a Coyne Trained man," reports Harold Soucy of Illinois. "I wish to thank your Employment Manager for securing this position for me," writes Albert Yagon, "he sent me out to this Company the first day and I was employed there immediately." And I could go on quoting from hundreds of letters of successful Coyne Trained Men. What they have done, you should be able to do!

Electric Refrigeration

Right now I'm including my big new Electric Refrigeration course at no extra cost.

Get the Facts

Coyne is your one great chance to get into electricity. Every obstacle is removed. This school is 34 years old—Coyne training is tested—proven beyond all doubt. You can find out everything absolutely free. Simply mail the coupon and let me send you the big, free Coyne book of 150 photographs . . . facts . . . jobs . . . salaries . . . opportunities. Tells you all about my PAY AFTER GRADUATION PLAN and how we assist our graduates in the field. This does not obligate you. So act at once. Just mail coupon.

Get This FREE Book

BIG PAY FACTS

Pay For Your Training After Graduation

If you are short of money this need not prevent you from getting my training. You can take my training and PAY FOR IT AFTER YOU GRADUATE—IN EASY MONTHLY PAYMENTS. Mail coupon for my plan.

COYNE ELECTRICAL SCHOOL
H. C. LEWIS, Pres. Founded 1899
500 S. PAULINA ST., Dept. 54-53 CHICAGO, ILL.

H. C. LEWIS, President
COYNE ELECTRICAL SCHOOL, Dept. 54-53
500 S. Paulina St., Chicago, Ill.

Dear Mr. Lewis:—Without obligation send me your big free catalog and all details of your offer on Electric Refrigeration and of your special offer and PAY AFTER GRADUATION PLAN.

Name. . . . .
Address. . . . .
City. *State*. . . . .

Chips from the Editor's Workbench

The Workbench is sending out an SOS for photos of MM radio "ham" outfits. Two prizes are offered for the best pictures submitted.

PHOTOS for the home workshop contest announced in the April issue are coming in fast. There still is time for some of you workshop fans to try for the two prizes offered. The contest closes April 15.

And this month we are ready to offer real money for photos of radio outfits built from plans published by MODERN MECHANIX AND INVENTIONS. All you have to do is snap a picture. Better take it outside if you don't know the tricks of photography. For the best picture submitted to the Editor's Workbench, accompanied by a brief letter explaining the set, transmitter, converter, or what have you, the editor will pay five dollars. For the second best, three dollars. The pictures must reach the Editor's Workbench, Modern Mechanix and Inventions, 529 South Seventh St., Minneapolis, before May 15.

* * *

Remember that article on a mouse circus? Judging from this letter from the author of the article, mouse circuses are becoming quite the thing. He says:

St. Louis, Mo.

Dear Editor:

I am enclosing for your kind inspection two pictures of a "Mouse Circus" made by a St. Louis man from my article. (The pictures were not clear enough to reproduce here.)

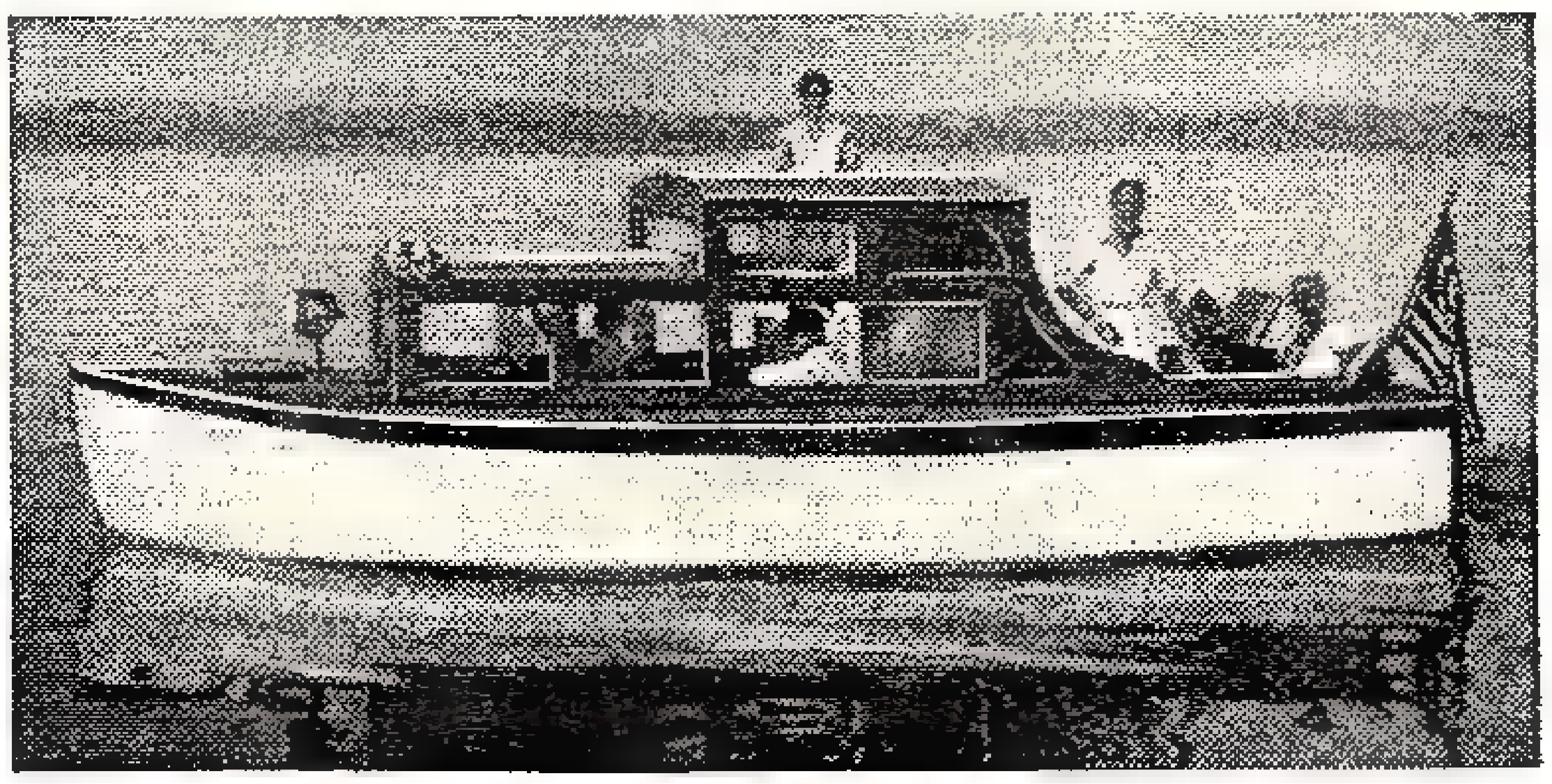
You may be interested in knowing that since the article has appeared, I've seen a great number of these sets in dozens of stores.

Harold L. Zimmer.

* * *

Pictures of some clever midget cars are arriving in every batch of mail. S. M. Shively tells us about his:

This midget car will do 15 miles an hour with its washing machine motor. S. M. Shively's letter tells how it's built.



The "Sunapee," 22-foot cruiser, is the newest ship in MM's popular fleet. Carl A. Gage, of Minneapolis, built the original above. The blueprints are now available.

Grafton, O.

Dear Editor:

I am sending a snap of another midget car. It is powered with a souped up battery type Maytag engine. Speed about 15 miles per hour. It has the crankcase compression raised and we made a high compression aluminum piston for it. The compression is about 85 lbs. per square inch and it must be run on Ethyl gas.

The best feature of the car is the sliding motor base which acts as clutch. To start, the shift lever is shoved forward, tightening belt and off she goes. A Model A Ford fan belt is used for drive, gear ratio is approximately 4 to 1. It is very easy on gas. Steering is by cable.

S. M. Shively.

* * *

Here's a letter from Austin E. Young that speaks for itself:

Syracuse, N. Y.

Dear Editor:

Last year I built the Dorothy, with the usual few changes of course. Started the job in April and launched her in September, 1932. Had to move her seven miles to the water.

October 19, 1932, we started for Florida with wifey and a friend via Barge canal and the so-called inland route down the Atlantic coast. Returned home seven months later having cruised over 3,000 miles. We lived aboard except for one month in New Smyrna, Florida.

The "Nameless," so-called because we started with no name, is powered with a model T Ford conversion which performed very well. The sail rig is sliding Gunter, used on account of the low bridges on the Barge Canal.

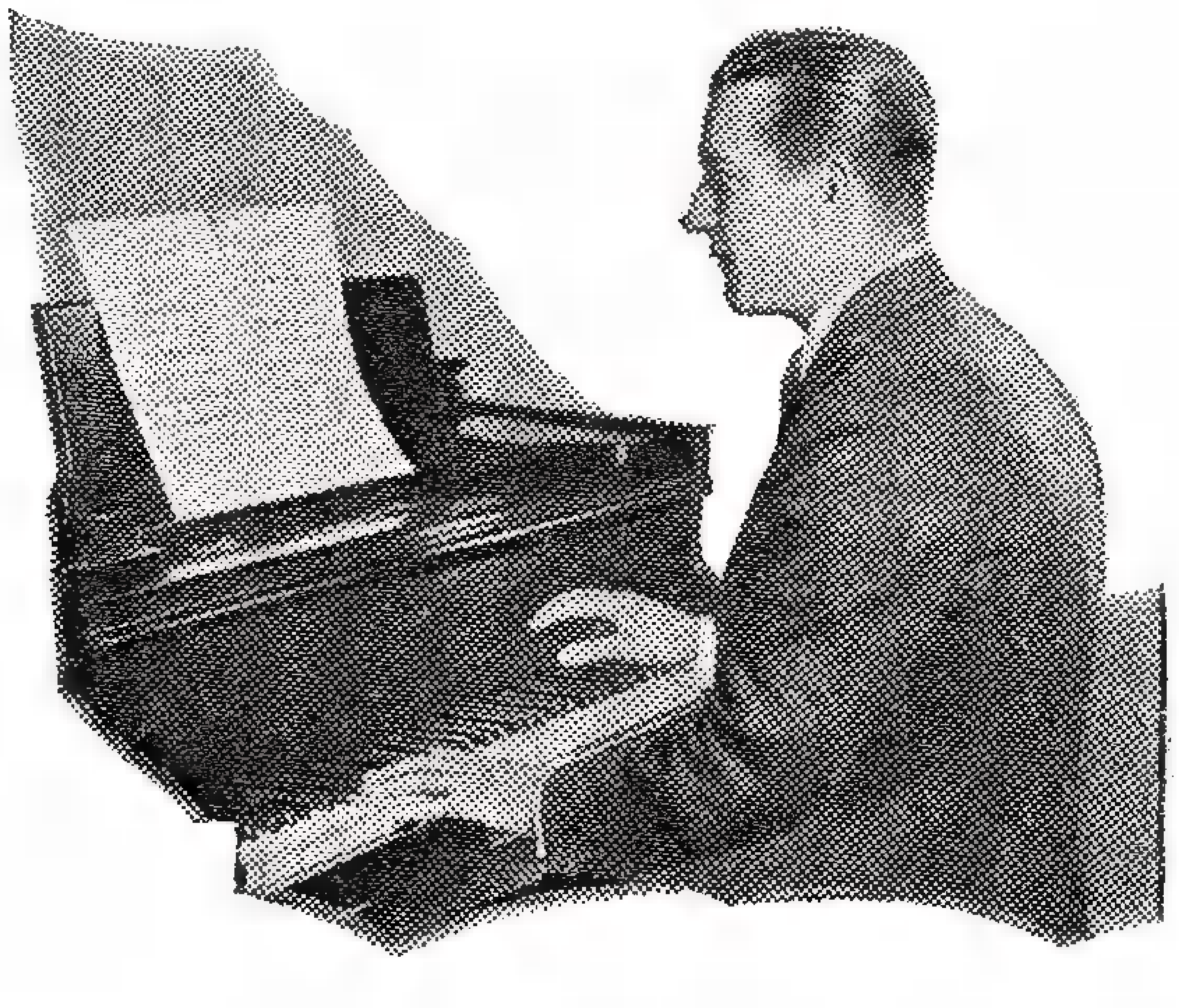
Austin E. Young.

* * *

A few stray chips . . . Turn to pages 94 to 97 and glance at the "Sportsmen's Campfire," conducted by Robert Page Lincoln. What do you think of it? . . . The "Sunapee," 22-foot motor cruiser, is just one of many how-to-builds in the new blueprint booklet that have never been published in M-M. Get your free booklet now . . . Many readers seeking information are forgetting stamped, self-addressed envelopes.

Why waste time on *old fashioned methods*

—when you can learn to play at home without a teacher



DON'T let the thought of long years of tiresome practice scare you away from learning to play! Don't let the thought of an expensive private teacher keep you from letting your dreams come true! For you—*anyone*—can easily *teach yourself* to play—right in your own home, in your spare time, and at only a fraction of what old, slow methods cost!

It's *so* easy! Just look at that sketch at the right. The note in the first space is *always* f. The note in the second space is *always* a. The way to know the notes that come in these four spaces is simply to remember that they spell *face.*

Now, isn't that simple? You don't have to know one note from another in order to begin. For the U. S. School way explains everything as *you go along*—both in print and picture—so that, almost before you know it, you are playing *real tunes and melodies* right from the notes.

You simply *can't go wrong.* First you are *told* what to do, then the picture *shows* you how to do it—then you do it yourself and *hear* it. No private teacher could make it any clearer.

Easy as A-B-C

No wonder over 600,000 men and women have learned to play this easy way! For this famous course is based on sound, fundamental musical principles, highly simplified. It's not a "trick" or "stunt" method. You learn to play from notes, just as the best musicians do. You learn to pick up any piece of music, read it, and understand it.

No time is wasted on theories. *You get all the musical* facts. You get the real meaning of musical notation, time, automatic finger control, harmony.

You'll find yourself studying the U. S. School way with a smile. Your own home is your studio. The lessons come to you by mail. They consist of complete printed instructions, diagrams, all the music you need. There are no dry-as-dust exercises to struggle through. Instead, it's just like playing a game—you learn so fast!

CHOOSE YOUR COURSE

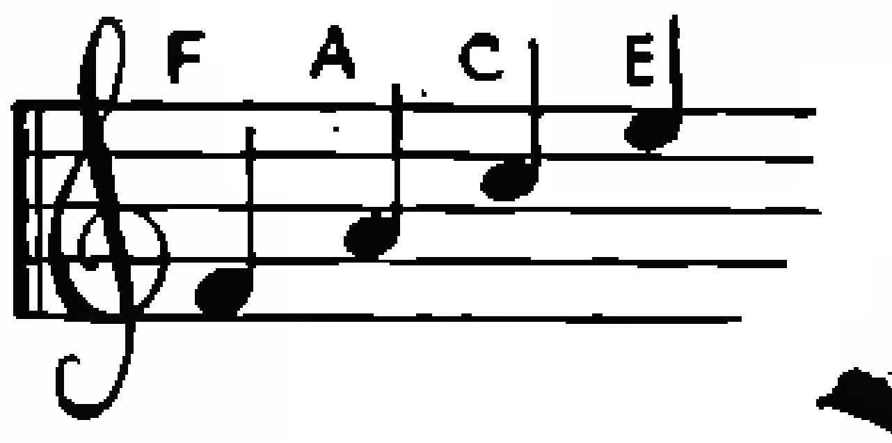
Piano
Organ
Violin
Drums and Traps
Guitar
Mandolin
Harp
Cornet
Piccolo
'Cello
Sight Singing
Ukulele
Hawaiian Steel Guitar
Clarinet
Flute
Saxophone
Trombone
Voice and Speech Culture
Harmony & Composition
Automatic Finger Control
Piano Accordion
Italian and German Accordion
Banjo (Plectrum, 5-String or Tenor)
Juniors' Piano Course

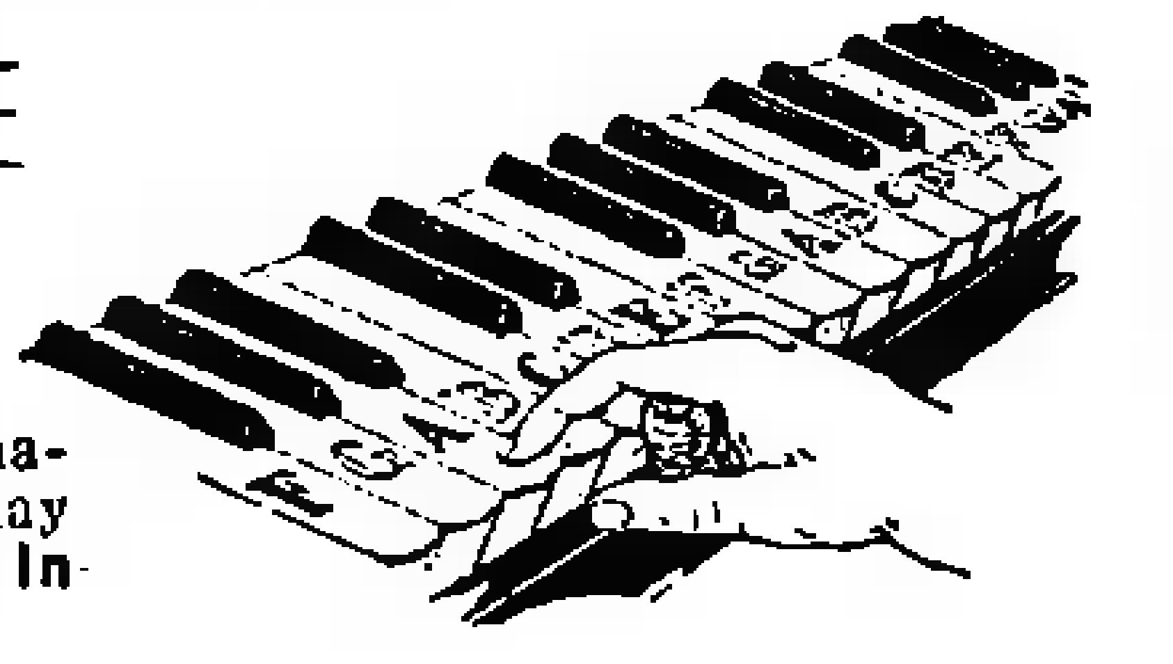
No Talent Needed

Forget the old-fashioned idea that you need "talent." Just read the list of instruments in the panel, decide which one you want to play, and the U. S. School of Music will do the rest. And remember—no matter which instrument you choose, the cost in each case will average just the same—only a few cents a day.

You'll never regret having learned to play. For those who can entertain with music at parties—who can snap up things with peppy numbers—are always sought after, always sure of a good time! Start now and surprise your friends!

Easy as A-B-C





If you can read the alphabet you can learn to play your favorite instrument in just a few months.

Free Book and Demonstration Lesson

"How You Can Master Music in Your Own Home" is an interesting little book that is yours for the asking. With this free book we will send you a typical demonstration lesson that proves better than words, how quickly and easily you can learn to play your favorite instrument by note—in less than half the time and at a fraction of the cost of old, slow methods—the U. S. School way. The booklet will also tell you all about the amazing new *Automatic Finger Control.*

If you really want to play—if new friends, good times, social popularity, and increased income appeal to you—clip and mail the coupon NOW. U. S. SCHOOL OF MUSIC, 2625 Brunswick Bldg., New York City.

Thirty-sixth Year (Established 1898)

U. S. SCHOOL OF MUSIC
2625 Brunswick Building, New York City

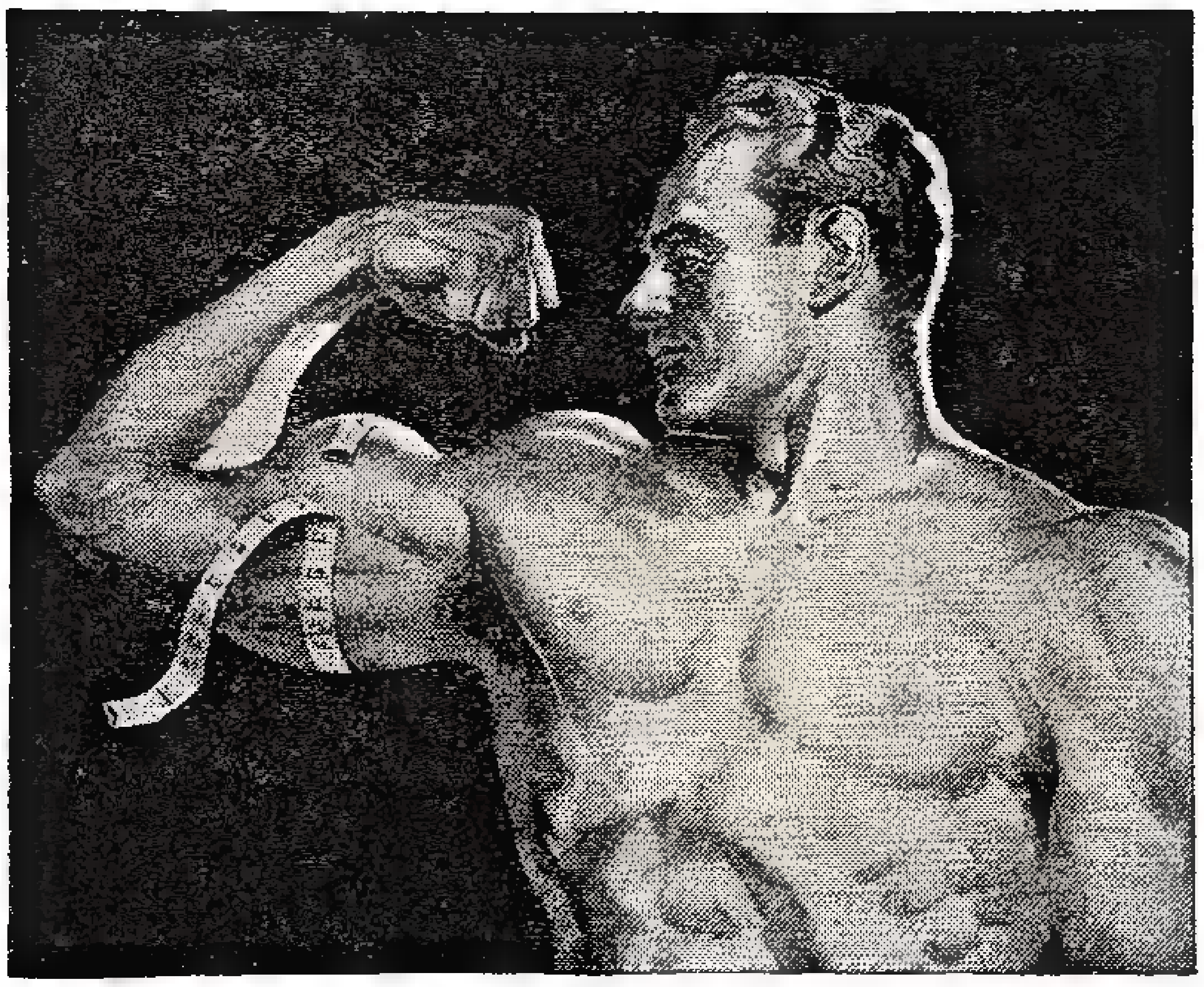
Please send me your free book, "How You Can Master Music in Your Own Home," with inspiring message by Dr. Frank Crane, Free Demonstration Lesson, and particulars of your easy payment plan. I am interested in the following course:

....Have you Instrument? ....

Name..

Address...

City...State...................



»If you do not add... 2 INCHES TO YOUR BICEPS

THREE INCHES TO YOUR CHEST

... it won't cost you one cent!"

Signed: GEORGE F. JOWETT

TWO solid inches of tough, sinuous muscle added to your biceps... three inches to your chest... or it won't cost you one penny! That's my unqulified agreement!

If I hadn't accomplished this for many others...If I wasn't absolutely sure that you could do it... I wouldn't dare make such a startling claim!

You will not only increase your biceps, but every part of your body will be developed proportionately... I'll show you how to add at least 3 inches on your chest... I'll show you how to get lithe, muscular legs that will be columns of power for speed and endurance... your whole body will vibrate with muscular energy, pep and health!

Take my full course, if it does not do all I say... if you are not completely satisfied...and *you* are the judge...it won't cost you one penny! I want you to try one of my test courses NOW!

Send for "Moulding a Mighty Arm" A Special Course for ONLY 25c.

It will be a revelation to you. You can't make a mistake. The assurance of the strongest armed man in the world stands behind this course. I give you my secret methods of development illustrated and explained as you like them. Mail your order now while you can still get this course for only 25c.

I will not limit you to the arm or chest... Try any one of my test courses listed below at 25c. Or, try all six of them for only $1.00.

Mail your order now and I will include a FREE COPY of **"NERVES OF STEEL, MUSCLES LIKE IRON."** It is a priceless book to the strength fan and muscle builder. Full of pictures of marvelous bodied men who tell you decisively how you can build symmetry and strength the Jowett Way! Reach out — Grasp this special offer!

NERVES of STEEL MUSCLES like IRON
MOULDING A MIGHTY ARM

FREE BOOK WITH PHOTOS OF FAMOUS STRONG MEN

JOWETT INSTITUTE of PHYSICAL CULTURE
Dept. [illegible] [illegible] Poplar St., Scranton, Pa.

Send, by return mail, prepaid, the courses checked below, for which I am enclosing $______

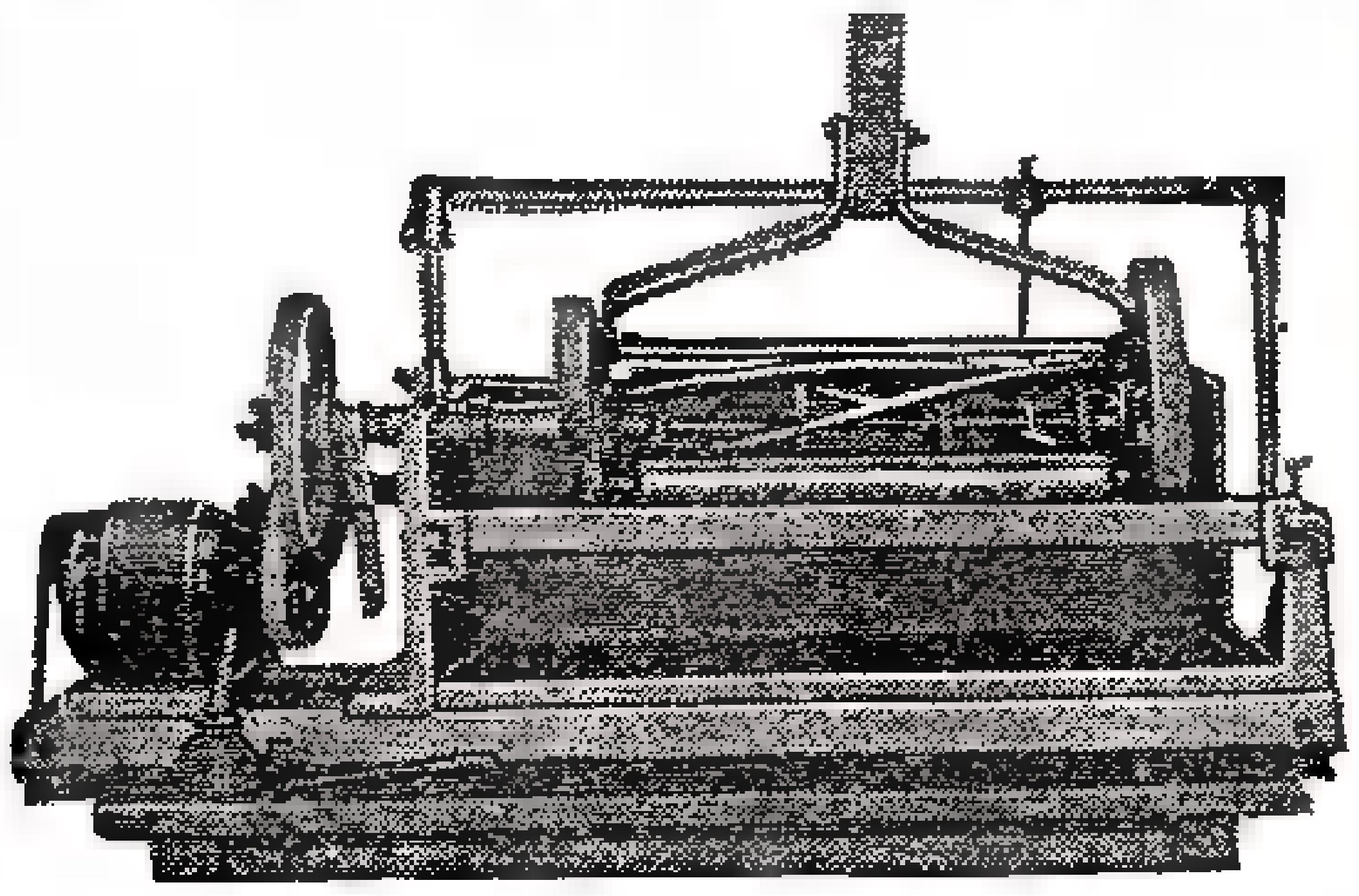
- ☐ Moulding a Mighty Arm . . . 25c
- ☐ Moulding a Mighty Back . . . 25c
- ☐ Moulding a Mighty Grip . . . 25c
- ☐ Moulding a Mighty Chest . . . 25c
- ☐ Moulding Mighty Legs . . . 25c
- ☐ Strong Man Stunts Made Easy . 25c
- ☐ All 6 Books for $1.00.

"Nerves of Steel" included FREE

*Name*____________________

*Address*____________________

Sharpened over 2,000 lawn mowers last season



Ivan G. Long

"I sharpened between 2,000 and 2,500 lawn mowers this season. I cover a territory of 50 miles around my home town and have all the work I can handle. With the Foley Lawn Mower Sharpener I can handle up to 40 mowers a day." Ivan G. Long, Penn.

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No experience required. Simply put mower in the machine—the Foley does a perfect job automatically, in 15 or 20 minutes. Sharpens all kinds and sizes by factory method. You get $1.00 to $2.00 each for hand mowers and $4.00 to $6.00 for power mowers. **Investigate NOW!**

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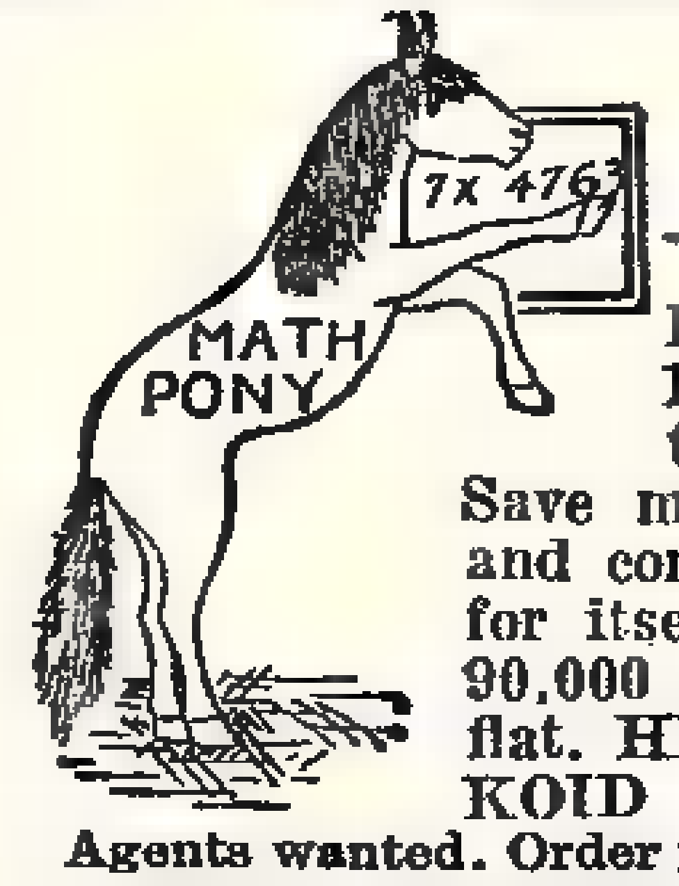

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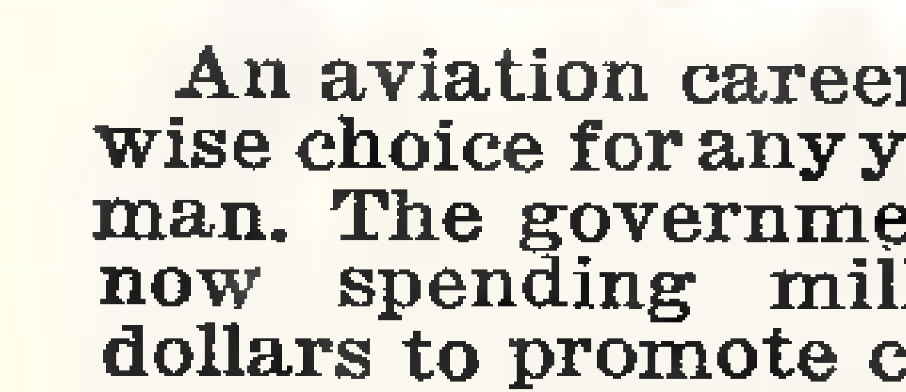

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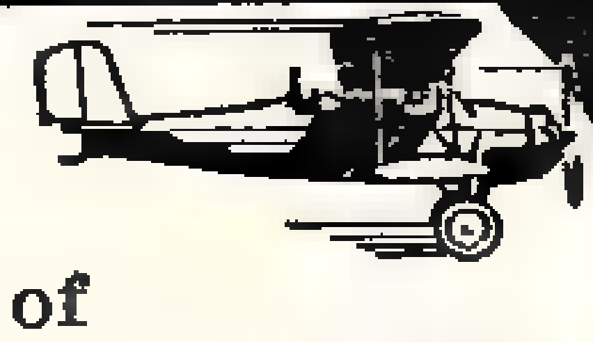

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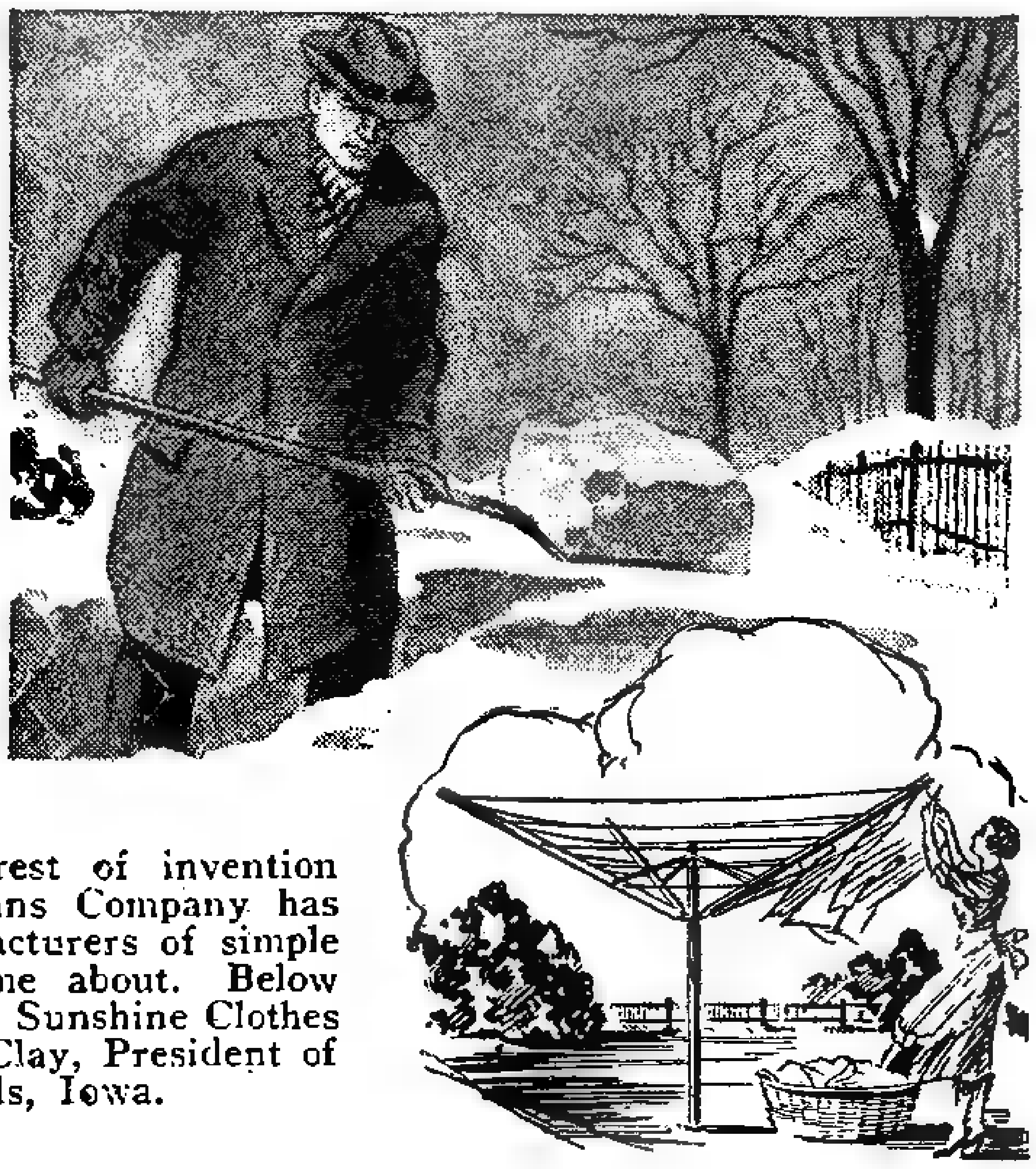
A SNOW STORM GOT ME STARTED AS AN INVENTOR

How a bad wash day led to an invention that developed into a successful business

By J. B. Clay
President of the Clay Equipment Corp.
Cedar Falls, Iowa

Often a little, simple invention turns out to be a big financial success. The crinkly hair pin, the rubber tip for lead pencils, the paper clip, these and thousands of other articles that we use every day of our lives, were the "happy ideas" of someone. In the interest of invention and inventors, the Victor J. Evans Company has asked successful American manufacturers of simple articles how these inventions came about. Below is the true story of the now famous Sunshine Clothes Drier, as told to us by Mr. J. B. Clay, President of Clay Equipment Corp., Cedar Falls, Iowa.



After tramping through a heavy snow like this to hang up clothes, Mr. J. B. Clay, President of the Clay Equipment Corp., decided he would figure out a better way. He did, and the modern Sunshine Clothes Drier shown at the left is the result.

WHAT! You mean to say I've got to shovel through a hundred and fifty feet of that snow to get to the clothes line; I'll be late for work!' I said, thoroughly peeved. But if I had only known it, that unpleasant foot of damp snow was a turning point in my life. It started me off as an inventor. It was the beginning of the large manufacturing business of which I am now the head.

"Because that morning, out there in that cold, wet snow, I decided I would figure out an improvement over the old clothes line stretched between two poles.

"Soon I worked out the idea of a big wheel placed horizontally on a pole with a line running round and round through the spokes. It was compact; it stood right behind the house; you stood on one spot, simply turning the wheel and it held a whole week's wash.

"It worked so well I decided to take out a Patent on it. By and by I was selling my clothes drier around town. Then, we began to manufacture it on a larger scale. Today the Sunshine Clothes Drier is the largest selling drier on the market and our company has prospered as a result of its popularity.

"In addition to the Sunshine Clothes Drier, I have since invented and patented other products for the home and farm. But it all started that wet, snowy morning when I began to think of a better way to do a simple chore. That snow storm has been worth many thousands of dollars to me."

If You Have a Good Idea—Protect It

Ideas that will make money, save labor or give pleasure are always in demand. If you have one, your very first thought should be to protect it, by means of a United States Patent. Without a Patent, you stand little chance to reap the profits which you, as the inventor, are entitled to receive. Further, you should not delay about making your application for a patent. This is a large country and it is not unusual for two or more inventors living many miles apart to conceive the same or practically the same idea, and the man whose patent application is filed first, usually has a better chance to secure the patent. So prompt action is often important in Patent matters.

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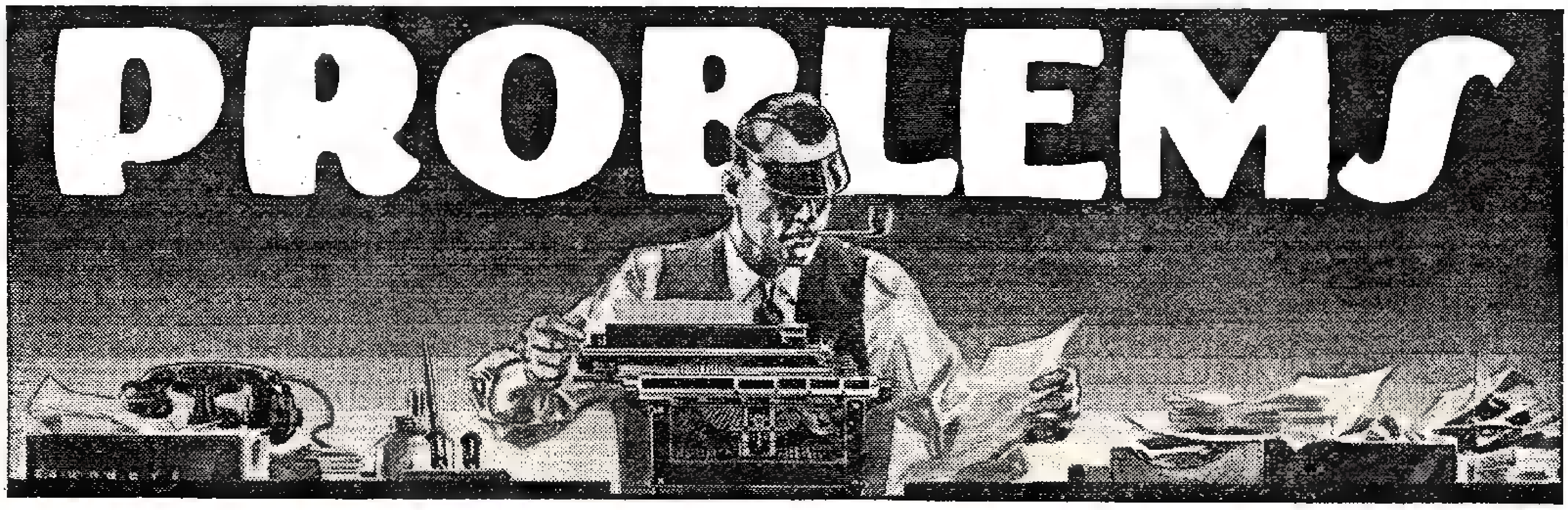
PROBLEMS



Interesting problem letters sent in by readers are answered in this department for your benefit.

RADIO-CONTROLLED MODEL BOATS

Where can I get plans for building a radio controlled model battleship? Is a license needed for operating it?—H. M. A., Frederic, Wisc.

Plans for this project were published in the 1930 How-to-Build-It book, which is still available here at 50c postpaid.

Regulations of the Federal Radio commission prohibit the use of spark coil transmitters of any kind. Experimental work on radio control of mobile units can be conducted with vacuum tube transmitters on amateur frequencies provided transmitter is licensed, and person operating it has an amateur radio operator's license.

* * *

CLEANING MARBLE TOMBSTONES

Is there any solution that will clean marble counters and tombstones?—L. B. H., Rolling Fork, Miss.

A weak solution of oxalic acid can be applied with a sponge or rag, washing quickly and thoroughly with water to remove all surplus acid. Rub well with finely-powdered chalk moistened with water to restore the luster.

* * *

ELECTROCUTING WEINERS

I have tried roasting weiners on two nails connected to 110 volt lines, but the "hot dogs" just won't get hot. Can you suggest a remedy?—A. B., St. Louis, Mo.

Pour a little salt water around the nails after the weiner is in place. This lowers the resistance of the meat, allowing more current to pass. It may be that the weiners used were a bit dry, and therefore high in resistance.

* * *

CONVERTING AUTO GENERATOR TO 110 VOLTS

Can a 6 volt Ford A generator be rewired to deliver a constant voltage of 110 volts a.c. at all speeds, for operating a car radio?—E. J. U., St. Paul, Minn.

Complete plans for the above generator conversion, together with instructions for rewinding and rewiring many other generators are given in the book "Auto-Power," which we can supply at $1.00 postpaid. Further details on the book will be sent free on request.

TWO-CYCLE ENGINE TROUBLES

In March "Problems" M. M. of Royston, Ga., had trouble with a two-cycle motor. This motor has no valves. The inlet and exhaust gases pass through ports in the side of the cylinders. The peculiar sucking and blowing through the intake manifold indicates that the piston should be turned half way around inside the cylinder.

Two spark plugs can be fired simultaneously with one spark coil by bringing out both terminals of the high tension winding, and connecting one to each plug. The body of the engine provides a path for current between the two plugs.—S. A. T., Minneapolis, Minn.

Many thanks for suggesting a cure for M-M's trouble and for telling of the spark coil kink.

* * *

ONE TUBE CONVERTER BLUEPRINTS

Do you have blueprints of the short wave converter which appeared in the March, 1934 issue of MM?—E. K. B., Greenfield, Ind.

A blueprint giving plans for the one tube adapter which appeared in October, 1933, together with the changes published in March, 1934, to make this adapter suitable for any radio, is available at 25c postpaid.

* * *

ALUMINUM CHEEKS FOR TARGET RIFLE

I have mounted a telescopic sight on my target rifle, and now wish to have a cheek rest made of aluminum. What material would you suggest for making the pattern?—E. L., Stoughton, Wisc.

Ordinary modelling clay should prove very satisfactory for your purpose. It is slow enough in drying to give plenty of time for trying out and reshaping the form to suit. After the desired shape of rest has been obtained, bake in oven to dry.

* * *

BUOYANCY OF PONTOONS

How can I compute the weight an air tight steel drum will support when partly submerged in water?—N. B. J., State Soldier's Home, Ohio.

This tank will support a weight equivalent to weight of the water it displaces. Compute the volume in cubic feet of that part of the tank under water, and multiply 62.4 pounds, weight of a cubic foot of water.

* * *

(Editor's Note—Because of space limitations, only letters of general interest can be answered in this department. For a personal answer to your problem, be sure to include a stamped addressed envelope with each letter.

LEARN RADIO FROM REAL RADIO ENGINEERS

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Dr. C. M. Blackburn, Chief Radio Engineer, Grigsby-Grunow Company (Majestic).

Kendall Clough, Chief Engineer, Clough-Brengle Co. (Radio Engineers and Manufacturers)

Karl Hassel, Chief Engineer, Zenith Radio Corporation.

Homer Hogan, Gen. Manager, Radio Station KYW, Chicago.

R. MacGregor, Service Manager and Sales Engineer, Transformer Corporation of America (Clarion).

H. C. Tittle, Chief Radio Engr., Stewart-Warner Corporation.

F. D. Whitten, Service Manager, Chicago Plant, Philco Radio and Television Corporation.

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It comes to you right from the Radio Industry—right out of the factories where Radio sets and other vacuum-tube devices are made. It was planned and prepared for you by big radio engineers IN these factories, most of whom are the Chief Engineers of these great Radio plants. And NOW these same engineers are actually supervising R-T-I Training. Which means that trained the R-T-I way, you'll be trained as the Radio Industry wants you trained—just as the Radio Industry, itself, would train you if it was doing the job.

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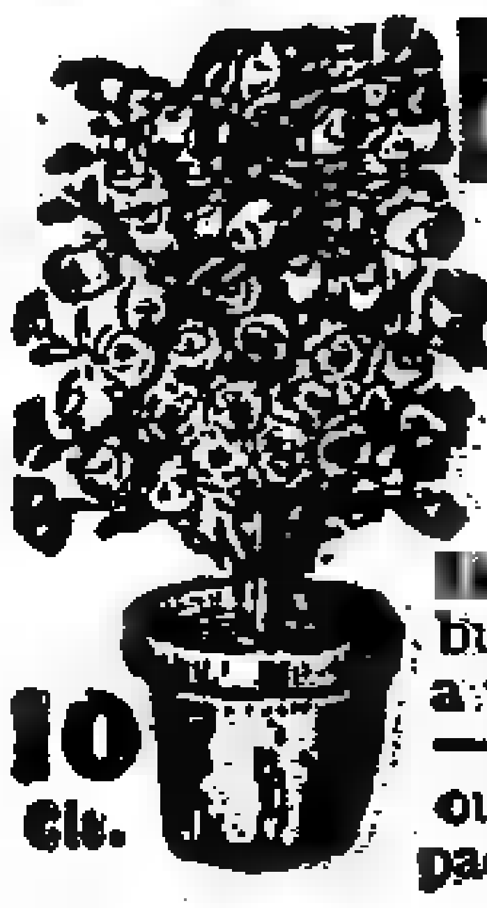

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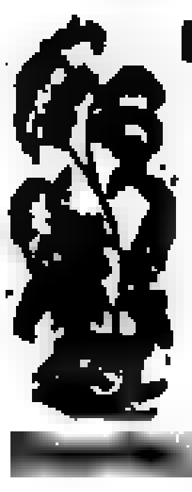

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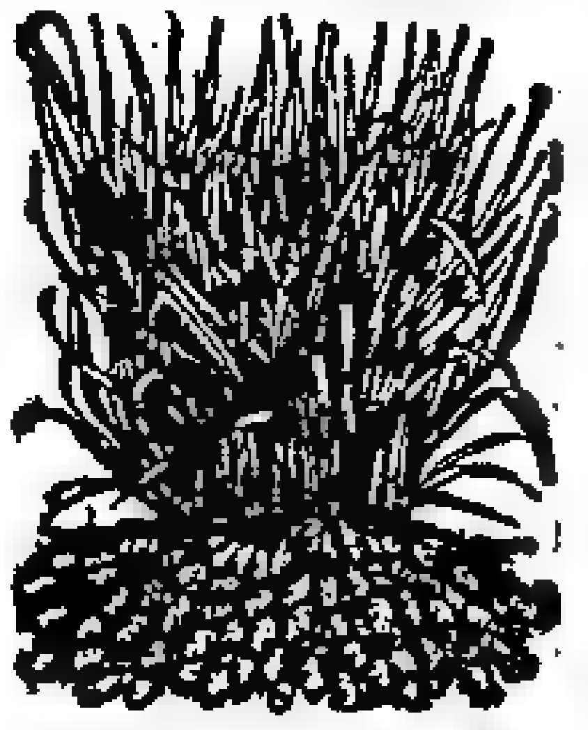
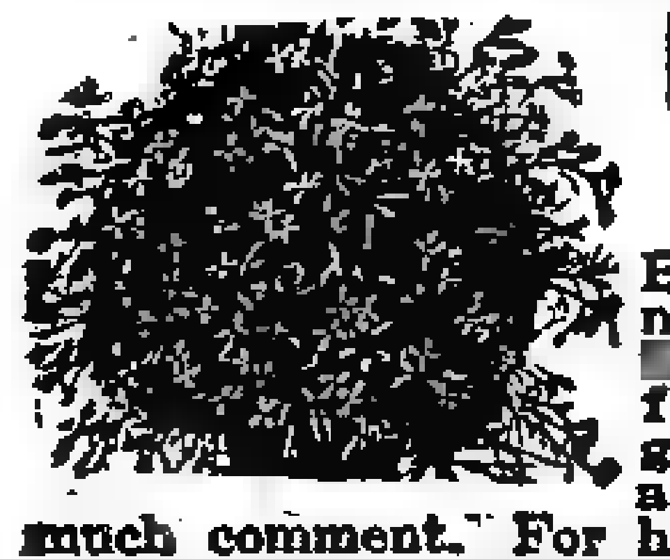
GROUND ALMONDS



Amazingly Prolific—Easily Grown From Seed

The Ground Almond has a flavor that [illegible] MOST EXCELLENT, resembling the cocoanut. The meat [illegible] white, covered with a shell or skin of brown color. It grows close to the surface and anything from 200 to 300 Almonds may be expected from a single nut. There is no trouble whatever in growing anywhere and [illegible] kind of soil. May be planted any time, and in eight or ten weeks from time of planting you will have an ENORMOUS CROP of the MOST DELI[illegible] ALMONDS YOU EVER TASTED. **[illegible] 15c Pkt.**

Perfume Plant

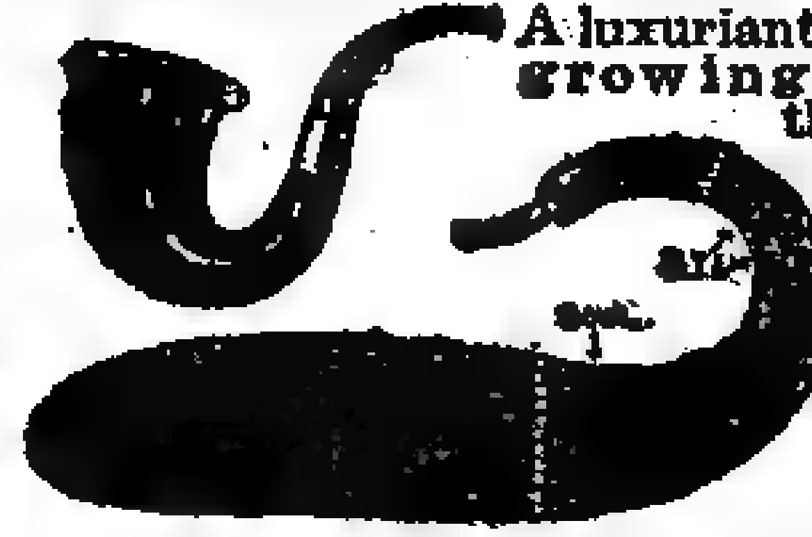


Blooms only at night, giving forth [illegible] most delightful scented fragrance for quite a distance. Causes much comment. For house [illegible] gard[illegible] Also valuable because of rare perfume [illegible] from it. **[illegible] 10c pkt., 3 for 25c.**

SENSITIVE PLANT

Marvel of the Philippines. Leaves curl, fronds droop when touched. Apparently resents interference. [illegible] handsome shrub for house or garden; very curious and interesting. **Seeds, [illegible] pkt., 3 for 40c.**

Calabash or Pipe Gourds



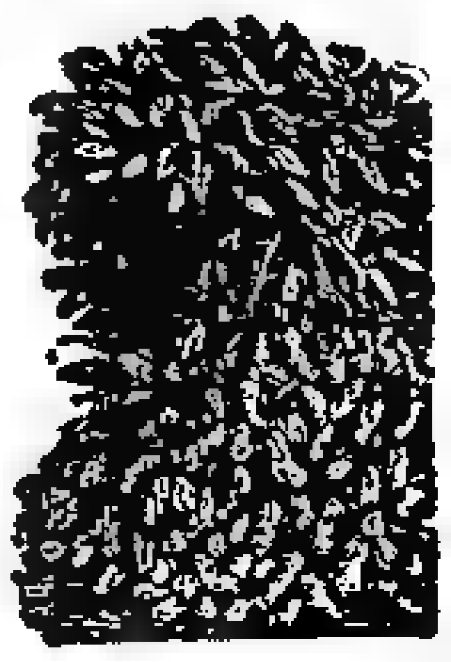
A luxuriant and rapid growing climber; thrives anywhere. Produces the ornamental gourds from which the famous African [illegible] pipes are made. Grow this interesting vine and make your own. Seeds, with instructions, **[illegible] pkt., 3 for [illegible]**

Japanese Nest E[illegible] Gourd

JAPANESE NEST-EGG GOURD

Very curious. Produces fruit same size, shape and color of nest eggs. Matured fruit does not crack. Will serve for years as a nest [illegible] stocking darner, ornamental purposes, etc. **[illegible] 15c pkt., [illegible] pkts. for 40c. J.S.&CO.**

Mammoth Peanuts



Peanuts can be easily cultivated. Their culture [illegible] very simple and exceedingly interesting. Mammoth Peanuts grow to [illegible] astonishing size. It is a good producer, very prolific, and the **giant nuts** have [illegible] thick, heavily ribbed protecting shell. The plant [illegible] very attractive, the leaves being of odd shape and a handsome green shade, tinted through the center with white. You will derive much pleasure cultivating [illegible] interesting species. **Seeds 15c pkt., 3 [illegible] for 40c.**

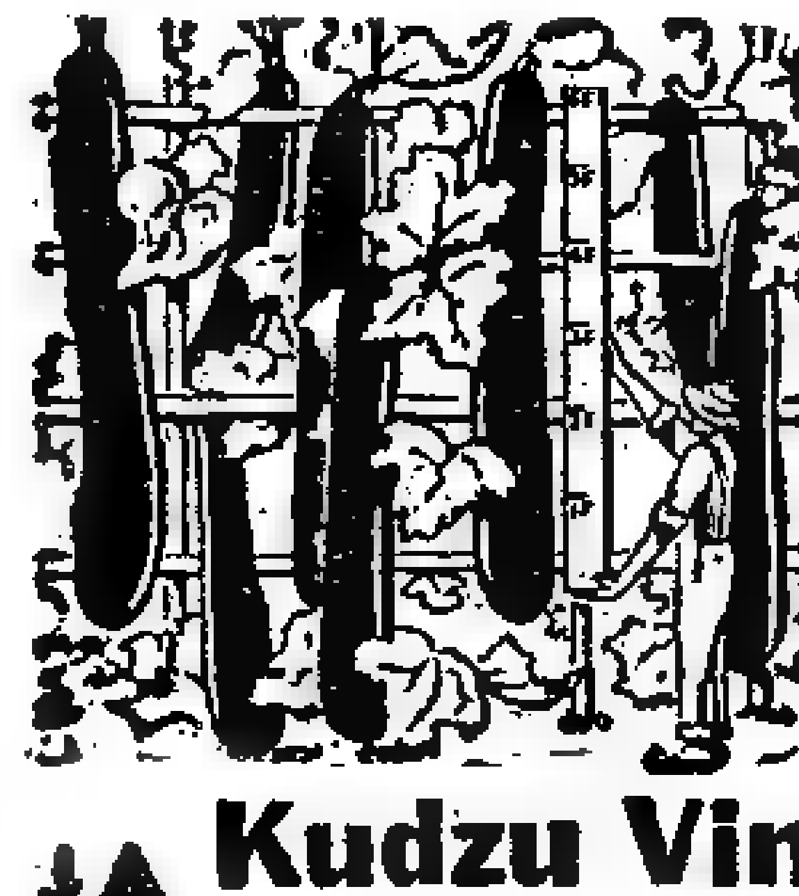
Musk Plant

A universally admired favorite for house, flower garden or greenhouse. A very fine house plant. Lives for years. Is of the sweet scented variety, giving forth much fragrance. Also valuable on account of the perfume that [illegible] be made from it. **[illegible] pkt., [illegible] 40c.**

Japanese Climbing Cucumber

Unusually strong and vigorous growing vine. Attains twice the size of ordinary varieties. Grows readily on fences, poles, trellises, etc. One hill will keep an entire family supplied all summer. **Seeds 15c packt, 3 for 40c, postpaid.**

GIGANTIC NEW GUINEA BUTTER BEANS



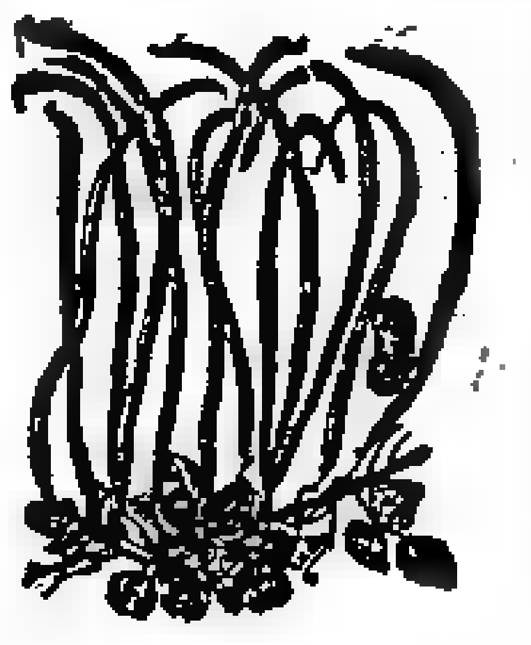
THE NEW EDIBLE VEGETABLE WONDER

Grows to [illegible] astonishing size, [illegible] Beans measuring from 3 to [illegible] feet long, and weighing anything from 10 to [illegible] lbs. and [illegible] more. One Bean [illegible] sufficient for [illegible] family for several meals. Very palatable and rich [illegible] nutritious materials. The delicate Buttery Flavor is much appreciated. The Vines are easily grown, very prolific, and [illegible] most welcome and valuable adjunct [illegible] your garden. Try them; you will find them the **most [illegible] vegetable you have [illegible] tasted.** Imported direct. Unobtainable elsewhere. Sample package of [illegible] with [illegible] directions for cultivating and cooking. [illegible]

Kudzu Vine

Most rapid growing vine known. Will grow 20 feet [illegible] one week. Luxuriant foliage, lovely purple flowers, very fragrant. Nothing to equal it for [illegible] purposes and quick growth. **Seeds 15c packet, 3 for 40c.**

Yard Long Bean

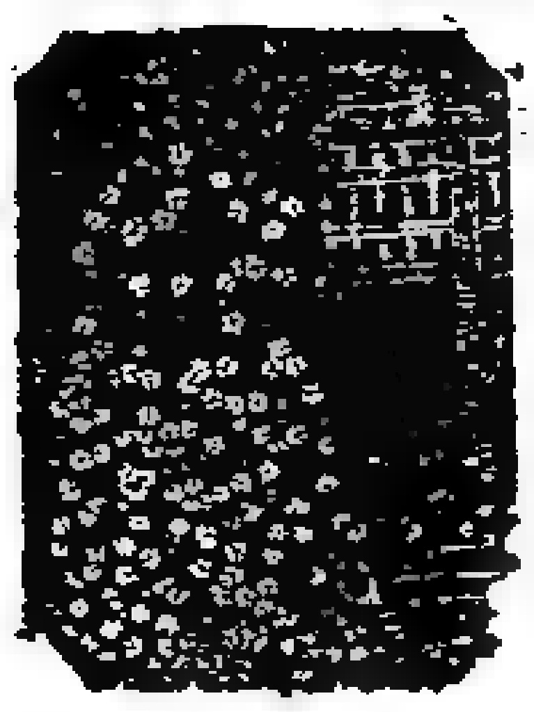


Produces enormous crop of long, slender, round pods, [illegible] excellent quality for snap beans. Pods grow from 2 to [illegible] feet [illegible] length. Very tender and fine flavor. The vines are rampant growers; an interesting curiosity. **Seeds 15c pkt., 3 for 40c**

THE REMARKABLE FIREFLY PLANT

A Vine that Blooms at Night

Fills the Atmosphere with Fragrant Aroma

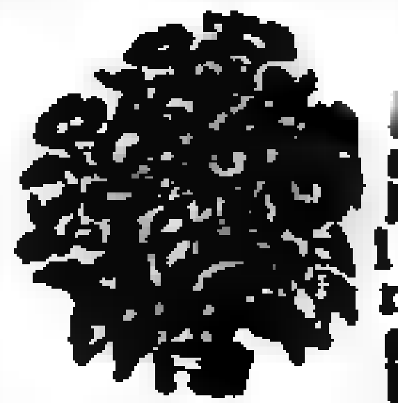


One of the most rapid growing vines known. Under favorable conditions this vine has been known to grow OVER 25 FEET IN A SINGLE WEEK. In a very short space of [illegible] indeed th[illegible] V[illegible] h[illegible] [illegible]bed to a great height, and is covered with IMMENSE FLOWERS, from [illegible] to [illegible] inches in diameter. It is, indeed, a great novelty, for, unlike other plants, the flowers OPEN IN THE EVENING, and remain open [illegible] about noon the following day. In dull weather they will remain open all day. It is a most INTERESTING SIGHT to watch the opening and closing [illegible] the flowers as [illegible] clouds [illegible] and dispe[illegible]. As the flowers [illegible] they give forth the most DELIGHTFUL AROMA and the whole atmosphere around is full of scented fragrance. It [illegible] always the object of favorable comment, and much curiosity [illegible] aroused by people passing [illegible] night time as to the cause of the charming aroma, frequently stopping in an [illegible] to satisfy their curiosity. **PRICE, 19 CENTS packet, [illegible] for 35 CENTS, POSTPAID. JOHNSON SMITH [illegible] CO.**

The Great Wonderberry

[illegible] luscious berry that may be grown and ripened from seed in any soil [illegible] climate in 3 months. [illegible] flavor is fine [illegible] unsurpassed for eating raw, cooked, canned or preserved in any form. The fruit [illegible] blue-black in color, and tastes like a luscious, rich blueberry. One [illegible] will produce an [illegible] amount of fruit, yielding great masses of rich fruit all Summer and Fall. **Packet, 10c, [illegible] pkts. for 25c, postpaid.**

Shoo Fly Plant



[illegible] very remarkable Botanical curiosity you should have. Though quite odorless it is said flies will not remain in a [illegible] where it is grown. Bears very pretty blossoms; blooms summer and winter. Grows rapidly from seed. **SEEDS 15c pkt.; 3 [illegible] 40c, postpaid.**

Banana Musk Melon

Quite [illegible] curiosity. Looks and smells like [illegible] banana. Peculiar shape and its delicious flavor make it well worth your while cultivating. Flesh is deep and of exquisite flavor. Very high prices are obtained in choice city markets, as high as [illegible] dollar sometimes being demanded for [illegible] single specimen. **Seeds 10c, 3 [illegible] 25c.**

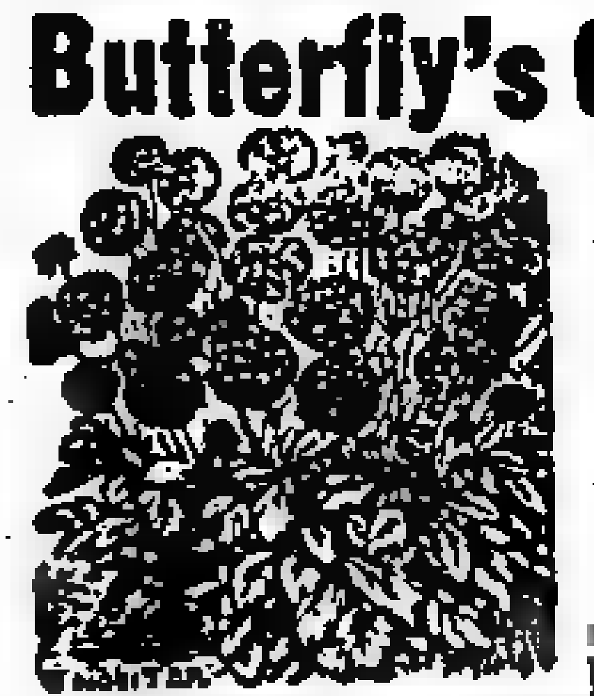
The Great Japanese Umbrella Palm

[illegible] Graceful [illegible] Conservatory Plant

Easily Grown From Seed Winter or Summer

The Japanese Umbrella Palm is [illegible] semi-aquatic plant. It is easily grown from see[illegible] either in a bowl of water [illegible] in very damp soil. Probably the most usual, as well as [illegible] most interesting method, [illegible] to cultivate the plant [illegible] a bowl or jardiniere filled with water, with two or three inches of good garden soil at the bottom. The seeds soon commence to germinate, and the plant shoots [illegible] stems two to three feet high and rapidly assumes a most pretty palm-like appearance, as shown [illegible] the engraving. The tops of the stems are surmounted by a whorl of umbrella-shaped leaves, of a waxy appearance. We will send a package o[illegible] thi[illegible] seed, with f[illegible]ll instructions for culture, **for only 15c or three packets for 40c postpaid.**

Butterfly's Own Bush



This plant [illegible] veritable refuge or haven for butterflies, and it attracts all the most beautiful types of butterflies to the neighborhood. Bees, too, are ver[illegible] fond of it. [illegible] pretty [illegible] bearing perfectly d[illegible]ble flowers, ranging from white to rich crimson, deep red and pink, lilac and other delicate shades. **Packet 10 [illegible] 3 [illegible] 25 [illegible] postpaid.**

CACTUS FROM SEED

Very curious, odd looking, strange species of plants; will thrive anywhere with little [illegible] no care. Flow[illegible] are of exquisite beauty and delightfully fragrant. You will be astonished at [illegible] odd looks of the Cacti just sprouting. **Packet, 10 cents, three packets for 25 [illegible]**

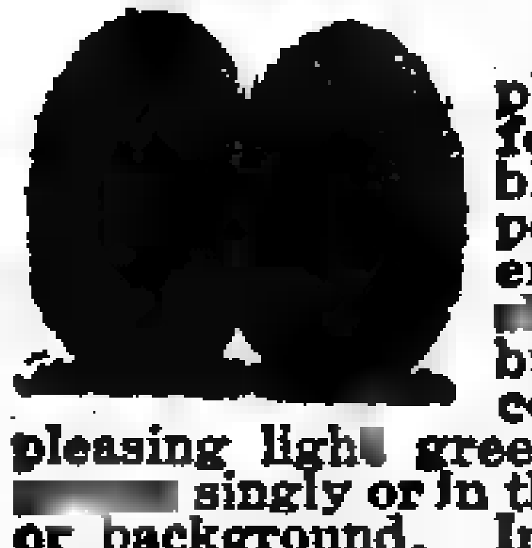
FERN SEED

Ferns [illegible] be grown from seed. Try your luck growing these beautiful plants for indoors or outdoors. Choicest mixed varieties. **Packet 10c., 3 for 25c.**

Chinese Cabbage

Novelty from China and should be grown in every garden. Seems to b[illegible] a cross between Celery and Cos Lettuce. Flavor is [illegible] mild than any other cabbage. **Can be served on the table** and eaten raw or cooked like cabbage, spinach or lettuce or made into salad. Grows very rapidly, easy to cultivate. You can create quite a sensation by cultivating this remarkable novelty. **Seeds, 15c packet, 3 pkts. [illegible] 40c.**

FAMOUS MEXICAN FIREFLY PLANT



Beautiful hedge plant, grows 2 to 2½ feet h[illegible]h and resembling [illegible] closely clipped ornamental evergreen. The [illegible]lobe-[illegible]ped [illegible] pyram[illegible] bushes are close and compact, and of a pleasing ligh[illegible] green color. May be [illegible] singly or in the form of a hedge or background. In early autumn [illegible] whole bush becomes carmine [illegible] blood red, hence the [illegible] of Mexican [illegible] Plant, or "Burning Bush," as it is sometimes called. **Selected Seeds, 10c**

Asparagus Sprengeri

The best plant for hanging baskets. Mas[illegible] of rich, gleaming foli[illegible] droop in a very graceful manner. The foliage when cut [illegible] decorative purposes [illegible] last for weeks in water. The seed pods [illegible] very pretty red berries adding to its beauty. **Packet, 25c, 3 pkts. [illegible] 65c postpaid**

TREE OF HEAVEN

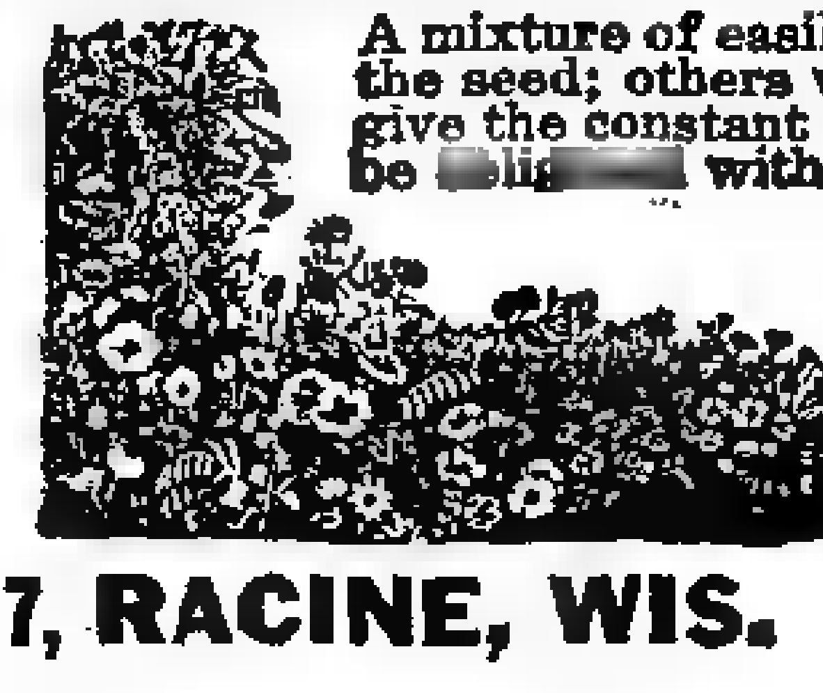
This splendid [illegible]mental tree is a native [illegible] China, and is called the Tree of Heaven, on account of its great beauty. Very hardy, thrives in any soil, no matter how poor, and grow[illegible] from 6 to 10 feet high from seed the first sum[illegible] The leaves [illegible] from 5 to 6 feet in any length, giving it [illegible] grand appearance. Nothing outside the tropics can rival it for lawn decoration. Large panicles of bloom, followed in season by great clusters of colored seed pods, make the tree [illegible] continual thing [illegible] beauty. **Packet, 15c; [illegible] packets 40c**

SURPRISE FLOWER GARDEN

Over Hundred Varieties [illegible] Mixed Flower [illegible]

[illegible] RARE AND CURIOUS NOVELTIES

An Abundance [illegible] Throughout [illegible] Season



A mixture of easily [illegible] annuals that bloom very soon after sowing the seed; others vary [illegible] their time of blooming. Those who cannot give the constant care necessary for finely arranged flower beds [illegible] be [illegible] with the Surprise W[illegible] Flower Garden. Will prove a continual surprise and pleasure, [illegible] new varieties and the old gard[illegible] favorites flower successively throughout the season. There are over a hundred [illegible] of seeds. Many of the plants may be taken inside as house plants and [illegible] bloom during the winter. Fine for children, [illegible] teachers for school gardens. **Packet, 15 cents, three packets for [illegible] cents, Postpaid. J. S. & CO.**

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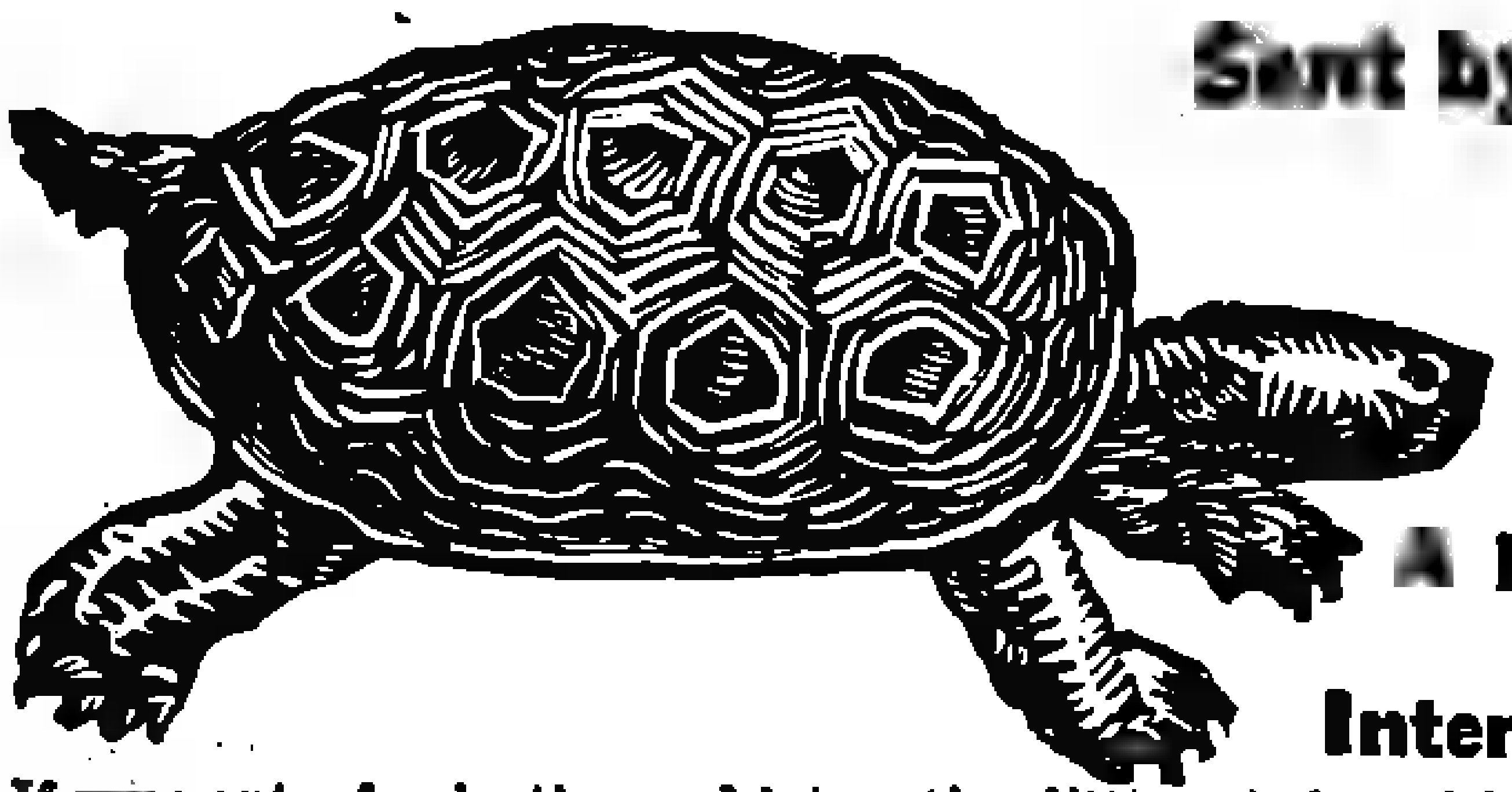
REAL LIVE PET TURTLES



Sent by Mail for Only

25c

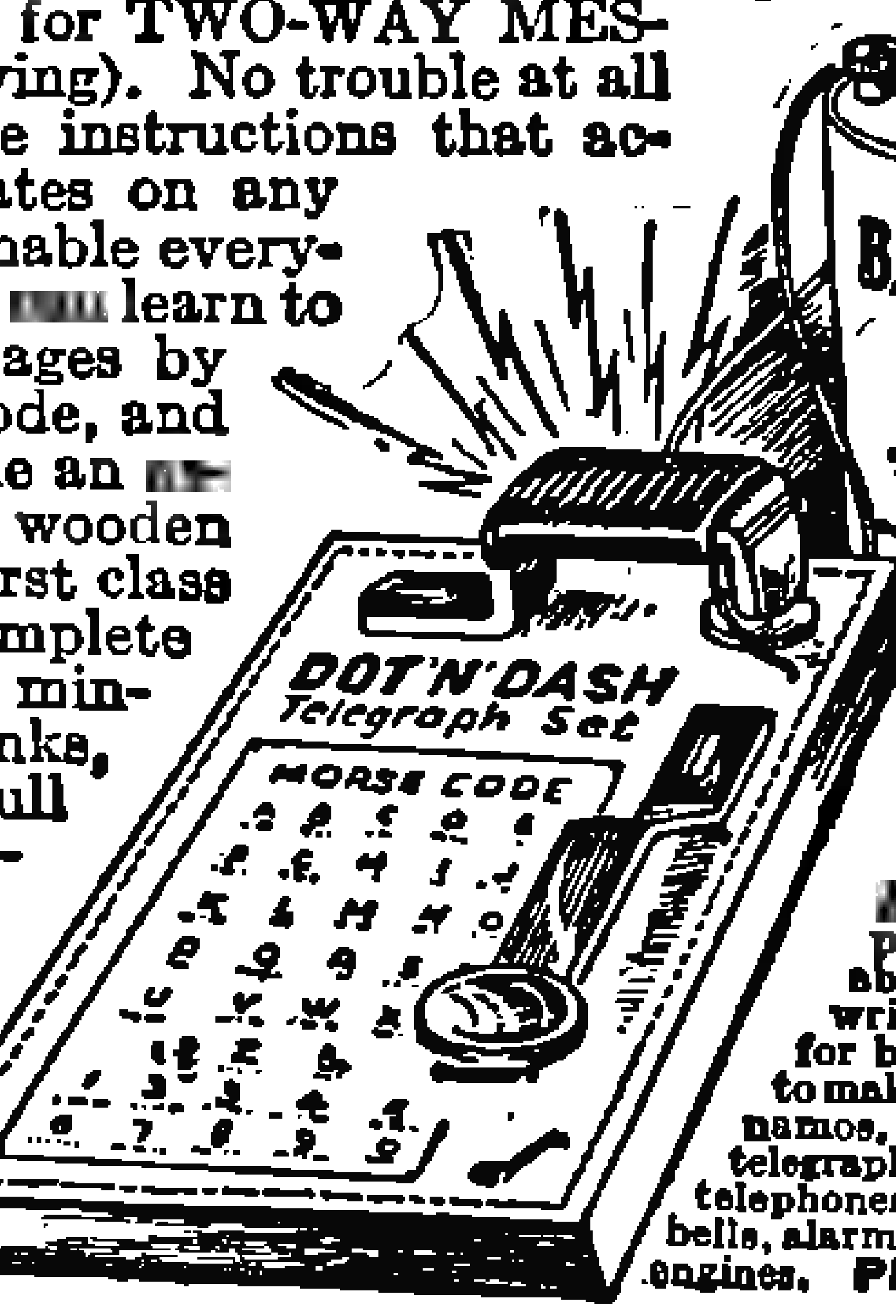
A Fascinating and Interesting Pet

If you want a fascinating and interesting little pet, just risk a quarter and we will send you a real live **PET TURTLE** by mail postpaid to any part of the U.S.A. Now all the rage. Thousands upon thousands of these Turtles were sold at the World's Fair in Chicago. No trouble at all to keep. Just give it a little lettuce or cabbage or let it seek its own food. They are extremely gentle, easily kept and live for years and years. Needs less attention than any other pet. Get one or two. Study their habits. You will find them intensely interesting. **ONLY 25c each sent by mail.** *Special Turtle Food 10c package*

Electric Telegraph Set

BOYS! A private Electric Telegraph Set of your own for **15c.** Lots of fun sending messages to your friends. Better still get two sets, hook them up as shown in the directions, for TWO-WAY MESSAGES (sending and receiving). No trouble at all to operate with the simple instructions that accompany each set. Operates on any standard dry battery obtainable everywhere. With this outfit you can learn to transmit and receive messages by the Morse International Code, and in a very short time become an expert operator. Mounted on wooden base measuring [illegible] x 3 in., first class construction throughout, complete with key, sounder, magnet, miniature Western Union blanks, packed in neat box with full illustrated instructions — **ALL FOR 15c (without battery) postpaid** (Canada and Foreign 20c.)

15c



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[illegible] [illegible] for 64 page book all about electricity written specially for boys. Tells how to make batteries, dynamos, motors, radios, telegraph apparatus, telephones, lights, electric bells, alarms, coils, electric engines. **PRICE 10c ppd.**

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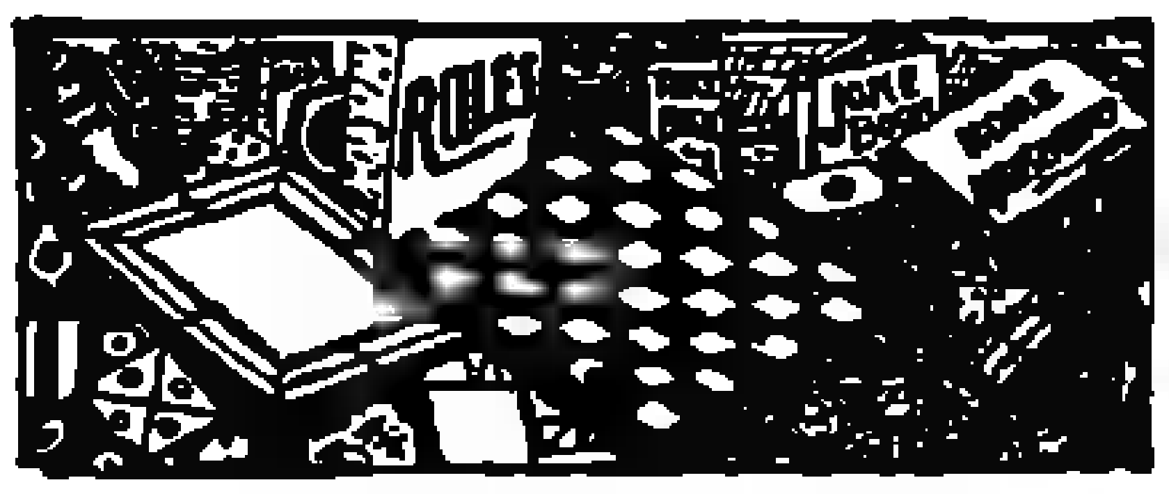
NEW VAMPING CARD

NO TEACHER NEEDED--SURPRISINGLY SIMPLE SYSTEM

Persons having neglected their Musical Education need not despair, for with the aid of our new VAMPING CARD (placing the card upright over the piano keys), you can Vamp away to thousands of Songs, Ballads, Waltzes, Rag Time, etc., etc. No knowledge of music is required. After using it a few times, you will be able to dispense with the aid of the Vamping Card entirely. The price of this very clever invention is only 15c postpaid.

BIG ENTERTAINER

FUN, MAGIC and MYSTERY



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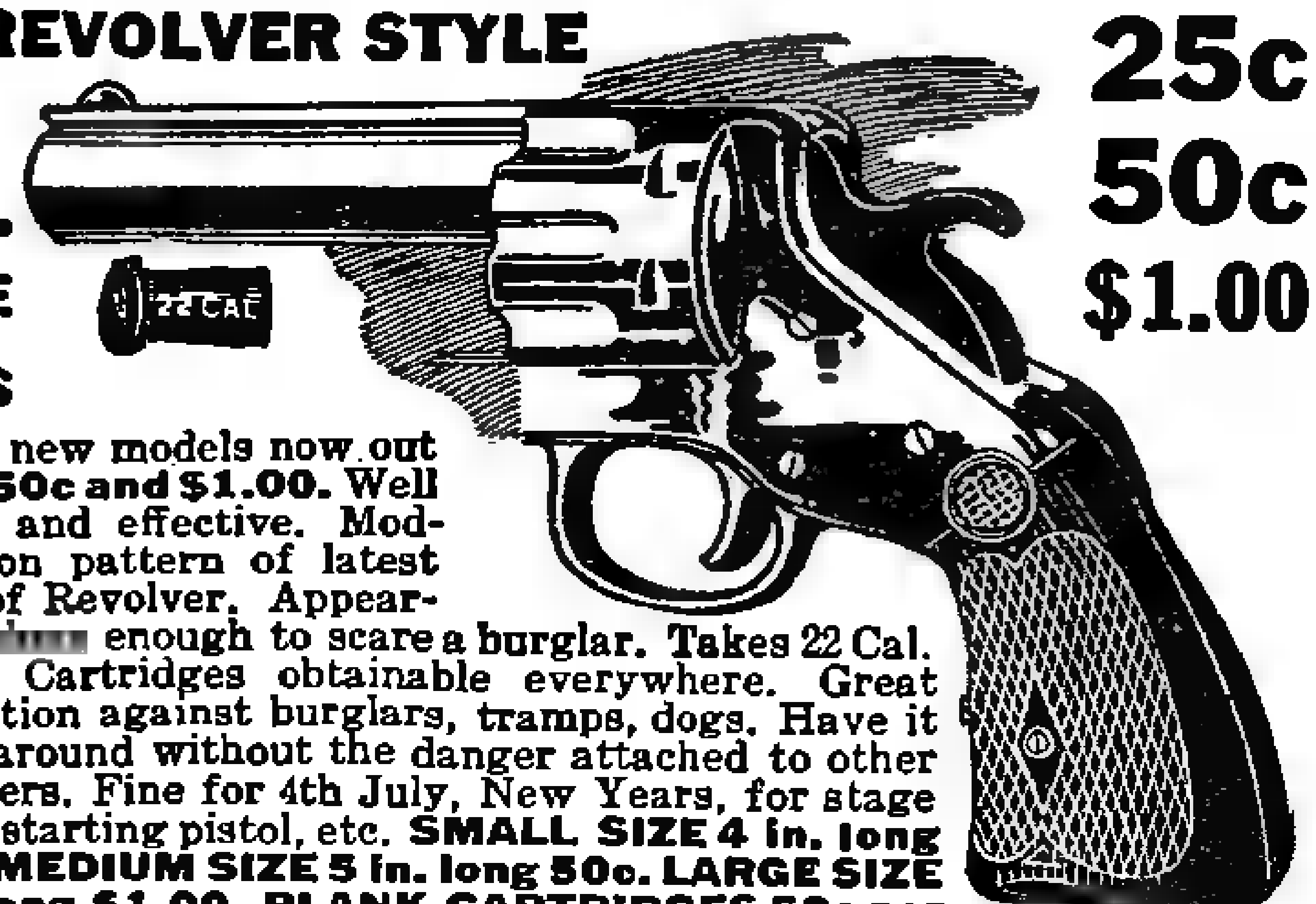
REVOLVER STYLE

.22 CAL.

MADE IN 3 SIZES

25c 50c $1.00



Three new models now out **25c, 50c and $1.00.** Well made and effective. Modelled on pattern of latest type of Revolver. Appearance alone enough to scare a burglar. Takes 22 Cal. Blank Cartridges obtainable everywhere. Great protection against burglars, tramps, dogs. Have it lying around without the danger attached to other revolvers. Fine for 4th July, New Years, for stage work, starting pistol, etc. **SMALL SIZE 4 in. long 25c. MEDIUM SIZE 5 in. long 50c. LARGE SIZE 6in. long $1.00. BLANK CARTRIDGES 50c per 100. HOLSTER (Cowboy type) 50c. Shipped by Express only not prepaid.** *710 page catalog of other pistols, sporting goods, etc. 10c*

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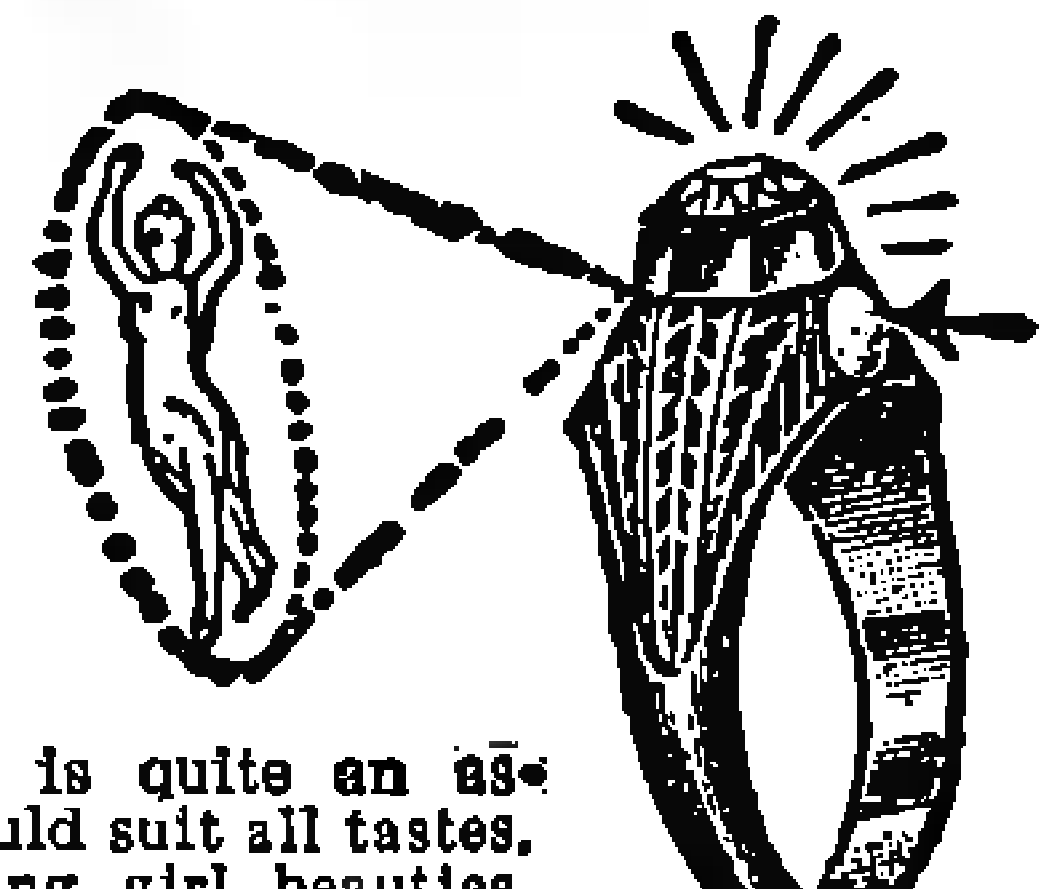

Here is a very great novelty in Rings, that is selling in thousands. It is a nicely made ring, finished in imitation platinum, and set with a large imitation diamond. It looks just like an ordinary ring, but in the shank of the ring is a small microscopic picture almost invisible to the naked eye, yet is magnified to an almost incredible degree and with astonishing clearness. There is quite an assortment of pictures that should suit all tastes. Some are pictures of bathing girl beauties, pretty French Actresses, etc., others are views of places of interest in France, Panama Canal and elsewhere; others show the Lord's Prayer in type, every word of which can be read by persons with normal eyesight. They are interesting without being in any way objectionable. **PRICE 25c, 3 for 65c, or $2.25 per doz. postpaid.** *7/0 page Catalog 10c.*

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Into a trunk, under the bed or anywhere. Lots of fun fooling teacher, policeman or friends.

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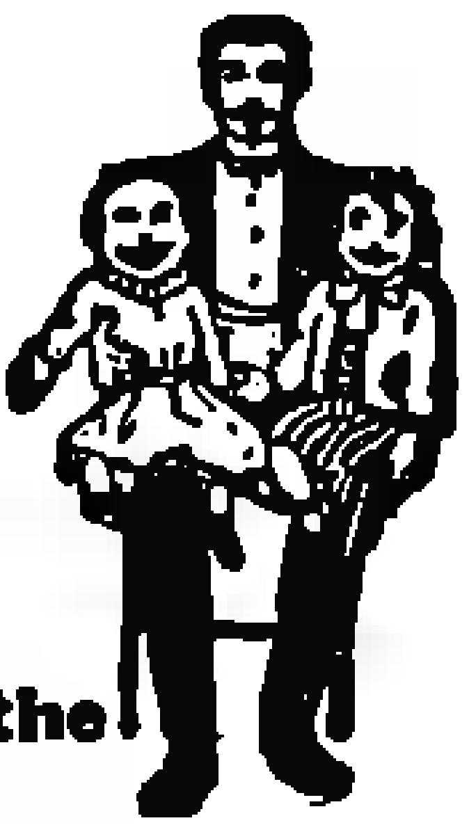

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FUN, MAGIC AND MYSTERY

No 4
FUN
MAGIC AND MYSTERY

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TEN Practical and inexpensive changes converting Dodge 12-V, Ford T, A, Chevrolet Delco 6-V generators into 100-500 watt capacity A.C. generators, or into 32-110-V. D.C. motor or generator. Dodge is 500-W self-excited. All in one book illustrated with complete simplified instructions and drawings for only $1. Autopower, 412 S. Hoyne Ave., Chicago.

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AGENTS' Gold Sign Letters for store windows. 500% profit. Free sample. Metallic Letter Co., 426 N. Clark, Chicago.

BIG money easily made—in home, office, business of your own, without peddling, little or no investment. Free particulars. Mayrer, 1435 Gunhill Road, Bronx, New York.

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BIG MONEY and Fast Sales. Every owner buys Gold Initials for his auto. You charge $1.50; make $1.45. Ten orders daily easy. Write for particulars and free sample. American Monogram Company, Dept. 11, East Orange, New Jersey.

CASH income daily resilvering mirrors at home. Replating autolight reflectors, tableware, etc., outfit furnished. Write Sprinkle, Plater, 850 Marion, Indiana.

MAKE MORE Money selling shirts, ties, underwear, dresses, hosiery, raincoats, coveralls, pants, uniforms, playsuits. Outfit Free. Nimrod Company, Department 132, 4922-28 Lincoln Avenue, Chicago.

BIG MONEY applying gold initials on automobiles. Easiest thing today. No experience needed. Free samples. "Ralco," 1084 Washington, Boston, Mass.

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AGENTS WANTED

BIG Money for you. Make, sell, printing cuts. Tremendous market. Learn quickly, amazingly easy copyrighted process. Free specimens. Hughes Products, 52 Miami, Terrace Park, Ohio.

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LEARN Ventriloquism by mail; small cost, 3c stamp brings particulars. Geo. W. Smith, 125 North Jefferson, Room 601, Peoria, Ill.

WANTED TO BUY

WANTED Maytag Washing machine motor. Will pay cash if in good running order. E. T. Sparks, Draper, N. C.

UP TO $20 each paid for Indian head cents; half cents $125; large copper cents $500, etc. Send dime for list. Romanos', Springfield, Mass.

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ARC-WELDING outfit $1.10. Weld fenders, braze, solder. Lavrow, 4368-W. Warren, Detroit. Stamp appreciated.

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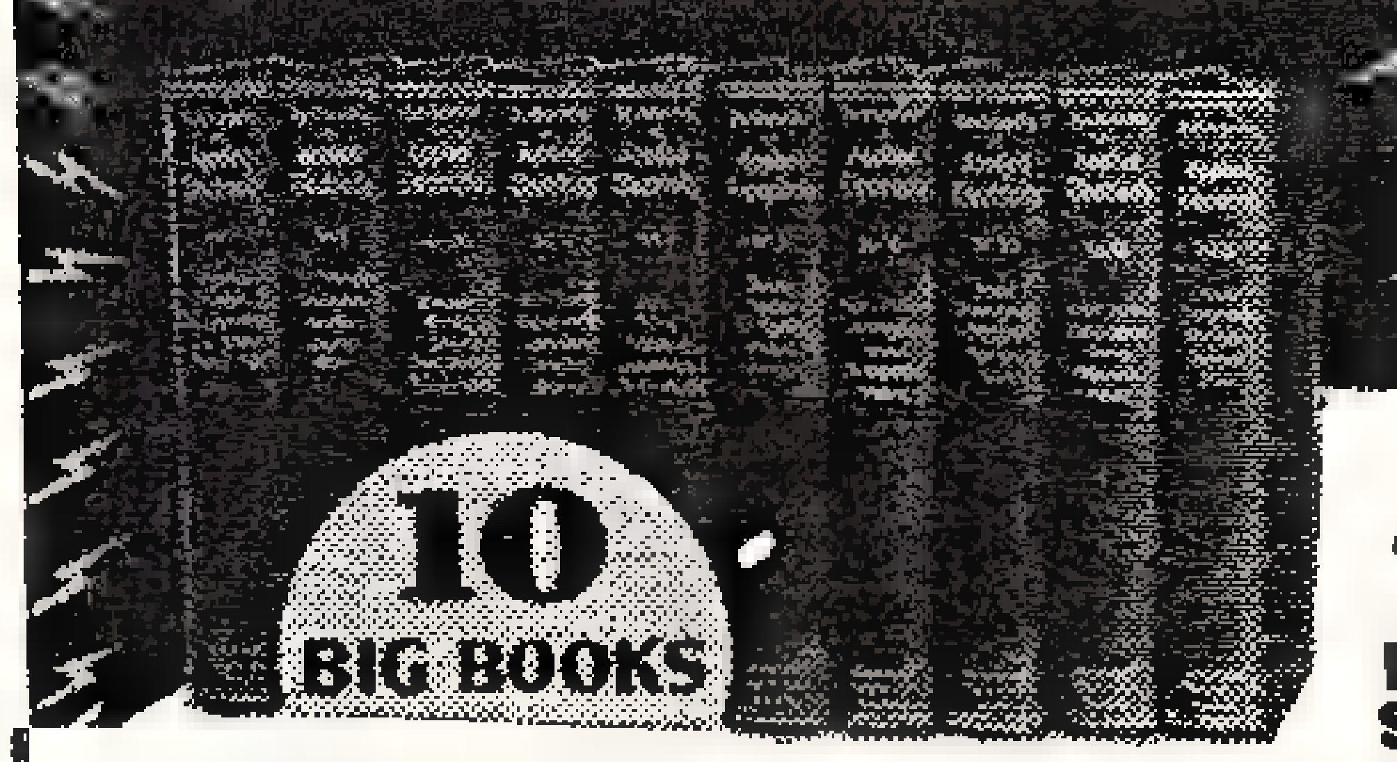

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An unusual combination of precision and low price, this substantially made instrument includes every refinement desired by the amateur microscopist, such as finely geared, smoothly functioning rack and pinion focusing, tilting stand, adjustable mirror removable for examination of objects by direct light, large stage, nickeled tubes and compound objective lenses. Complete with 1 prepared and 2 plain slides, dissecting needle.

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Similar but without rack and pinion .... $[illegible]

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☐ Show Card Lettering
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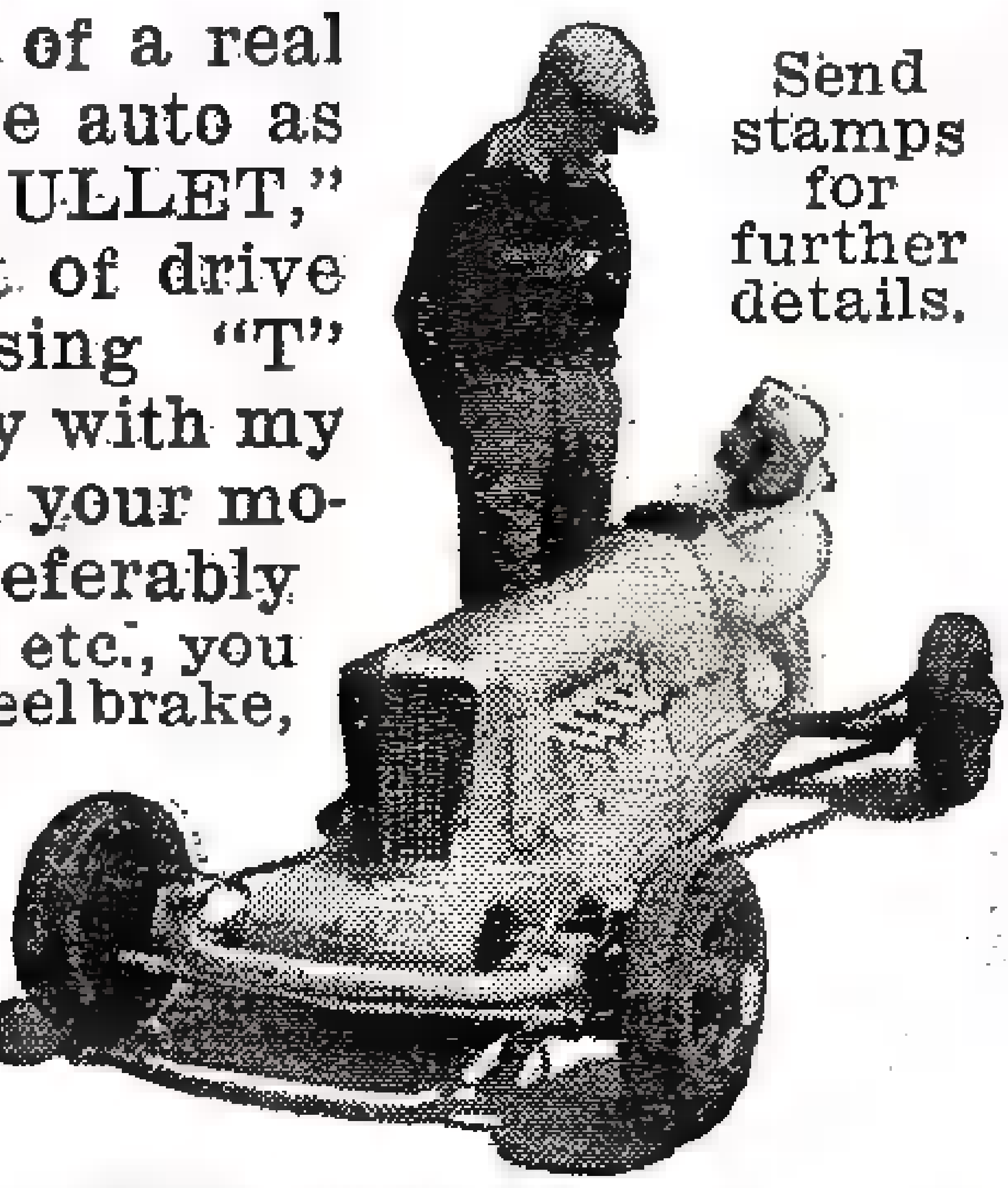
Name .... *Age* ....

Address ....

BUILD A FRONT DRIVE!



The construction of a real midget front drive auto as this "SILVER BULLET," with the simplest of drive arrangements, using "T" Ford parts, is easy with my blue prints! With your motorcycle motor, preferably 4 cyl., old car parts, etc., you can make this 4 wheel brake, front drive; best of all you don't have to own a machine shop to build this fast car most economically.

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FREE BOOK

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Dept. 430, St. Louis, Mo.

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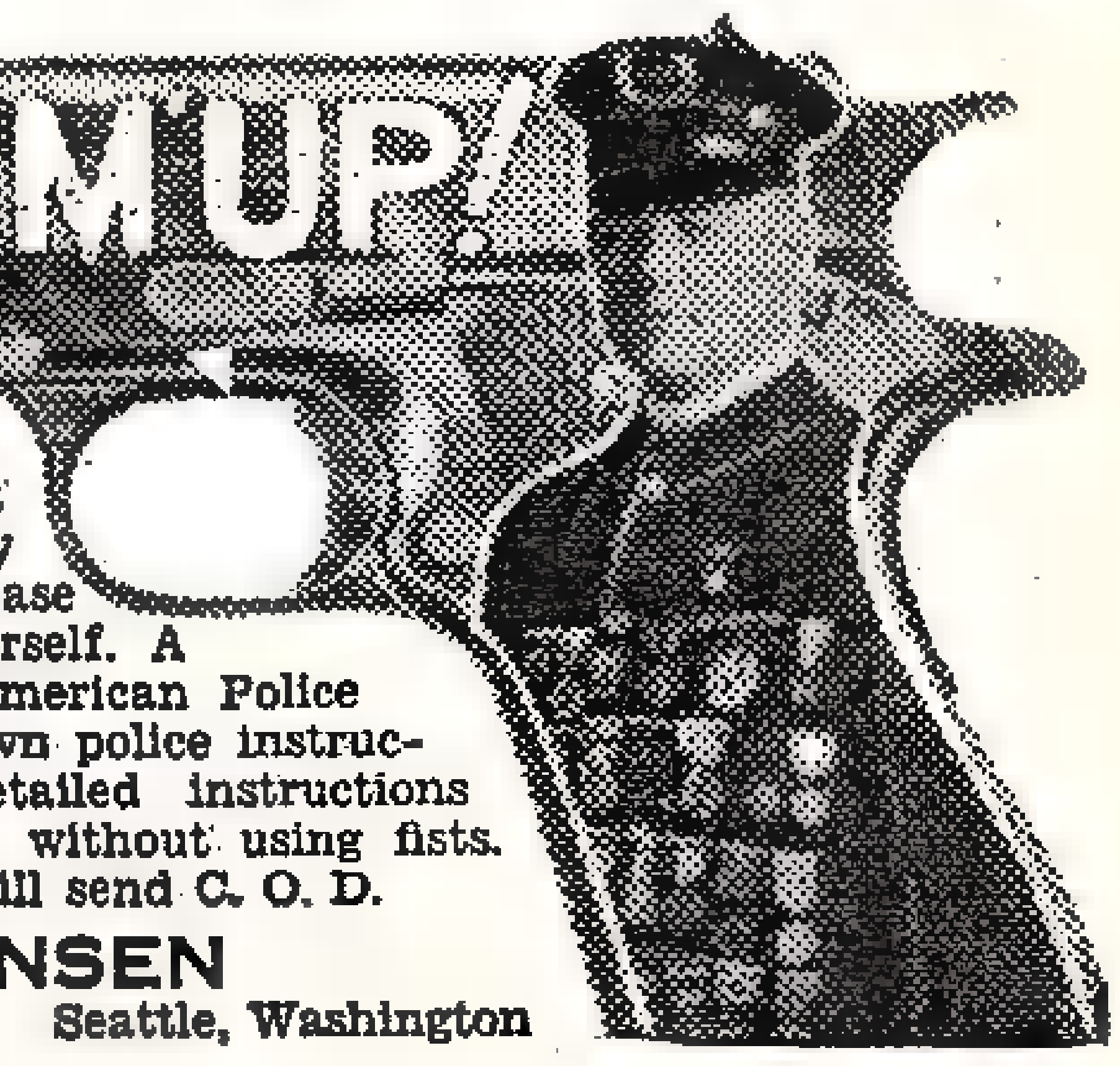

Regardless of strength or size defend yourself and friends against any foul attack, from bullies or by gun, knife or club. Subdue with ease persons much stronger than yourself. A complete course on approved American Police Jiu-Jitsu by internationally known police instructor 151 illustrations with detailed instructions pocket size. 13 knockout blows without using fists. Send One Dollar Full Price, or will send C. O. D.

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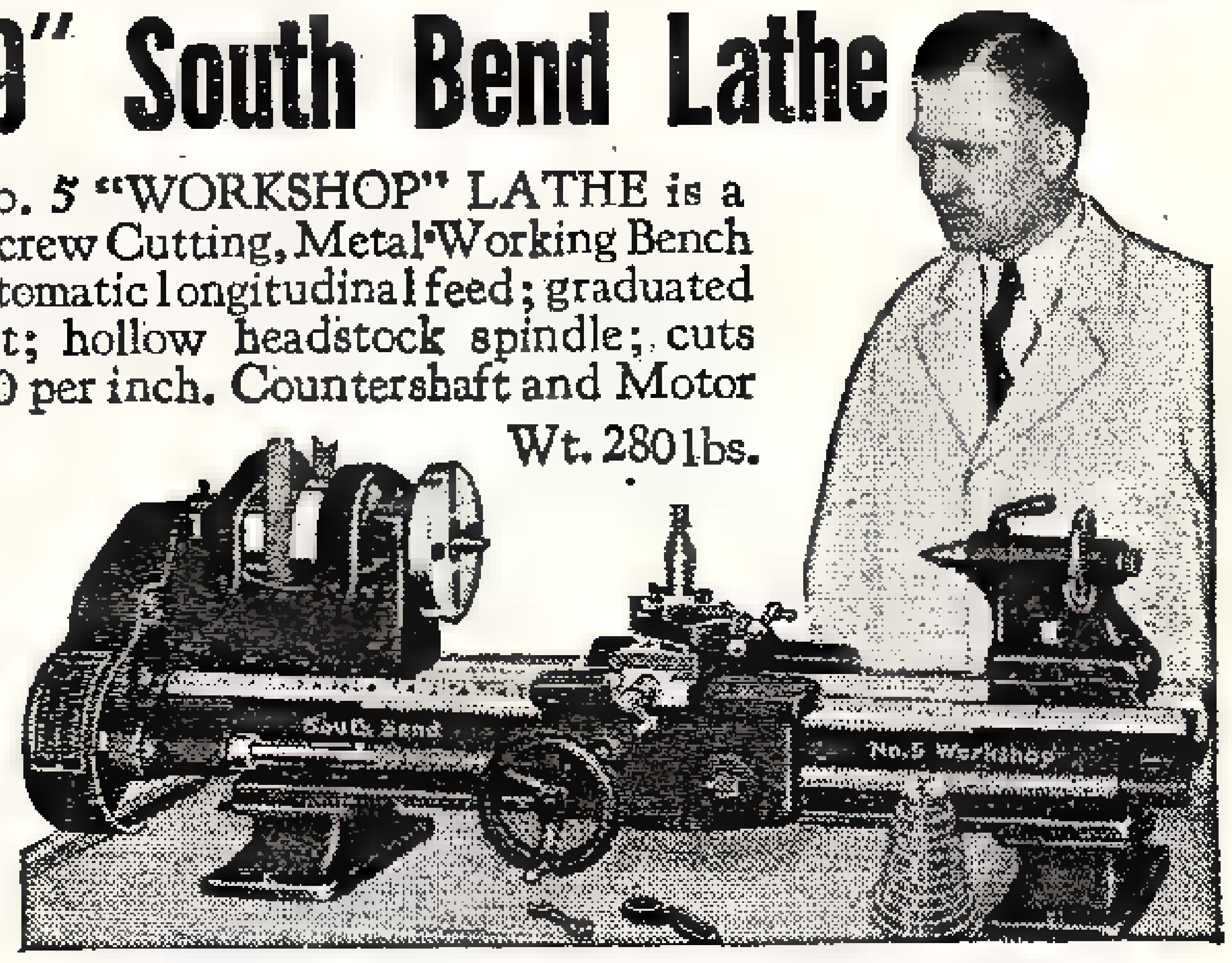
New 9" South Bend Lathe

The 9"x3' No. 5 "WORKSHOP" LATHE is a Back-Geared, Screw Cutting, Metal-Working Bench Lathe with automatic longitudinal feed; graduated compound rest; hollow headstock spindle; cuts threads 4 to 40 per inch. Countershaft and Motor Drive Types. Operates from light socket. Wt. 280 lbs.



$75 *as shown less motor*

Easy terms

Write for Free Descriptive Circular No. 5-W.

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518 E. Madison St. South Bend, Ind.

Start a Potato Chip Factory

Be a Wholesale Distributor

A new, fast way to have plenty of money to pay your bills—meet the mortgage—live well—BE YOUR OWN BOSS. Make 500 to 600 Per Cent INCREASE on raw materials—keep up to 80c out of each dollar you take in. Start right in your own home or in a vacant store—any place where you have a few square feet. My NEW SIMPLIFIED METHOD and COMPLETE OUTFIT starts you in a permanent, profitable business manufacturing four tasty foods—delicious crisp Potato Chips, Cheese Chips, Do-Nuts and Salted Nuts. You begin making money at once. No experience needed. I place 50 years of Successful Experience of LONG-EAKINS COMPANY behind you to assure your success.

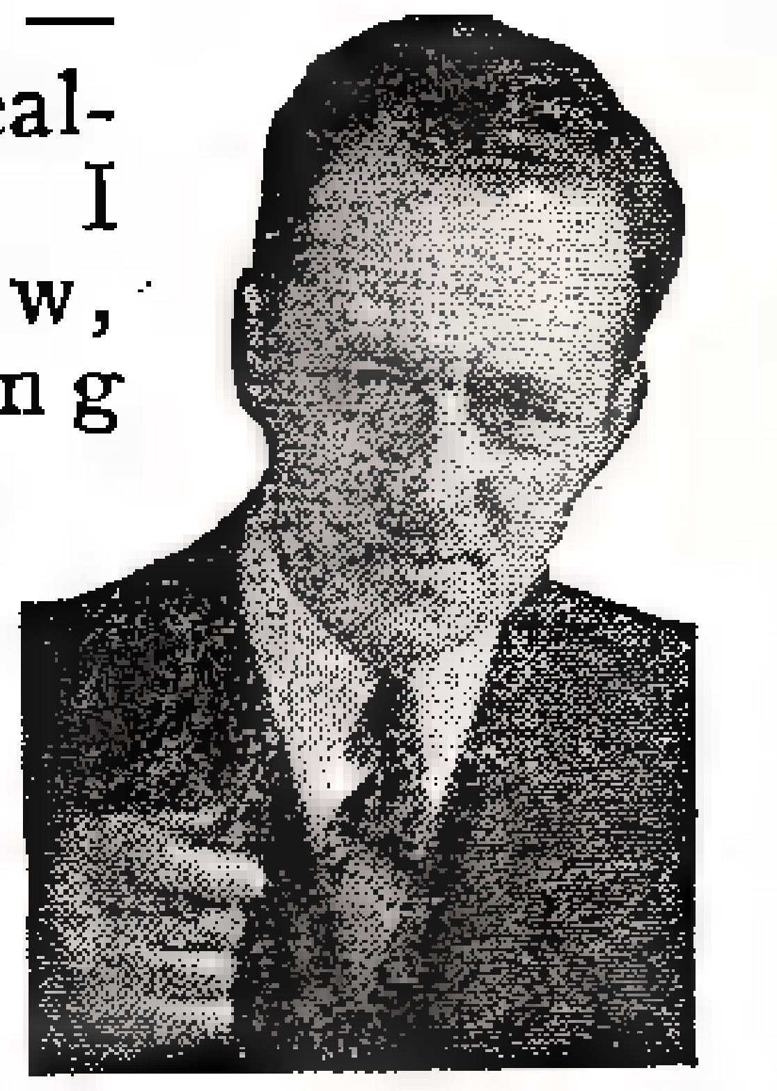
AS LOW AS
$130
COMPLETE
EASY TERMS

Here's another way to take your town by storm—set this BIG, ATTRACTIVE LOOKING OUTFIT up in a show window and see the crowds gather round. Let the people see the delicious Potato Chips or Do-Nuts tumbling out, and they will crowd around you in droves and buy your factory fresh Potato Chips. The illustration below of the Chromium Plated Vat Furnace and Direct-to-Fat Slicer is only a small part of the complete equipment I furnish in my big KITCHEN COOKED OUTFIT.

COMPLETE OUTFIT

Chromium Plated Furnace, New Improved Type Gas Burner, Chromium Plated Cooking Vat, Metal Drain Board for Vat, Direct-to-fat Slicer, Large Drain Basket, Large Wire Chip Skimmer, 8 Raw Chip Baskets, Drain Pan for Baskets, Grease Thermometer, Stirring Paddle, Eye Remover and Peeler, Fine Mesh Skimmer, Glassine Bags, Dealer Circulars

I Plan the Selling for You— You Supervise and Collect the Profits



Be a Wholesaler — make established dealers your salesmen. I have Brand New, Sure Fire selling plans. All you do is tell the dealers about this plan—and the PROFITS START ROLLING IN. With my new plan you can also have every boy and girl in town selling Potato Chips for you. This plan is so simple, you can instantly see it will make you famous over night. Groceries, Delicatessens, Restaurants, Bakeries, Soda Fountains, Drug Stores, Confectionery Stores and scores of other dealers do all the retailing for you. Dealers everywhere waiting to be supplied. COMPLETE INSTRUCTIONS. Formulas direct from my Testing Plant in Springfield—all furnished to you.

PAY AS YOU EARN—

Low Easy Terms

I make terms to good, honest, industrious people who show me they want to make money quick. You don't need a lot of money to start—get it back the first few days you operate. A bag of potatoes, some cooking fat, and a little salt, and you are ready to go. EVERYTHING FURNISHED to start for less than a down payment on a cheap car. CASH COMES BACK QUICK.

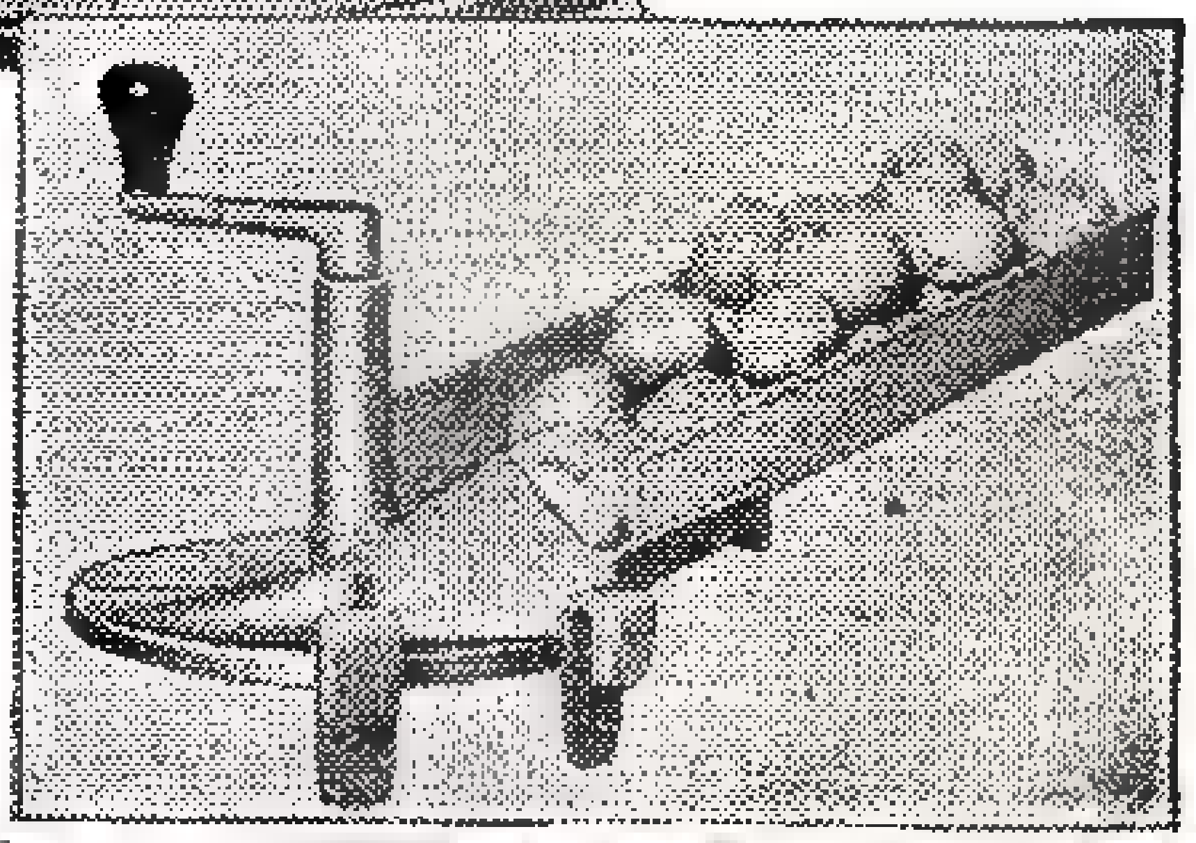
READ What Indiana Operator Says F. A. PEOPLES

"For the past six years I have been knocking about on one thing to another—all the time on the lookout for a substantial and dependable business, which could be established with small capital. In looking through a magazine, I came upon an advertisement of the Long-Eakins Company, located in Springfield, Ohio. I went over there and was perhaps over-cautious and in all, made three trips before deciding I was on the right track. I have had this outfit in operation for just seven days and to say I am both surprised and delighted is putting it mild—selling all the Chips I can make."

500% INCREASE

On Raw Materials

Actual tests show $8.00 CASH SALES from 63c Raw Potatoes, made into Chips. My specially constructed Cooking Vat gives Outfit greatly increased capacity. Fries 16 ounces fine Quality, Finished Chips in FOUR MINUTES. Many food authorities are now recommending the sale of unpeeled Chips because they retain the minerals found in, and under the skin of the Potato. With my new KITCHEN COOKED OUTFIT you can specialize in Mineral (unpeeled) Chips — Besides Potato Chips, you can make extra profits with Do-Nuts, Salted Nuts and Cheese Chips.



With my new improved slicer, included with this outfit, a full "frying" of raw potatoes can very quickly be sliced into the vat at one time. Slicer is attached to the frying vat so that the peeled or unpeeled potatoes fall directly into the hot fat---saves trouble of soaking and draining chips.

SEND FOR *Free* NEW BOOK

H. W. EAKINS, President,
Long-Eakins Company,
542 So. High St.,
Springfield, Ohio.

Dear Sir:
I am anxious to make money. Send me all the facts without any obligation. Tell me how I can get in this amazing, new business, QUICK.

NAME ....

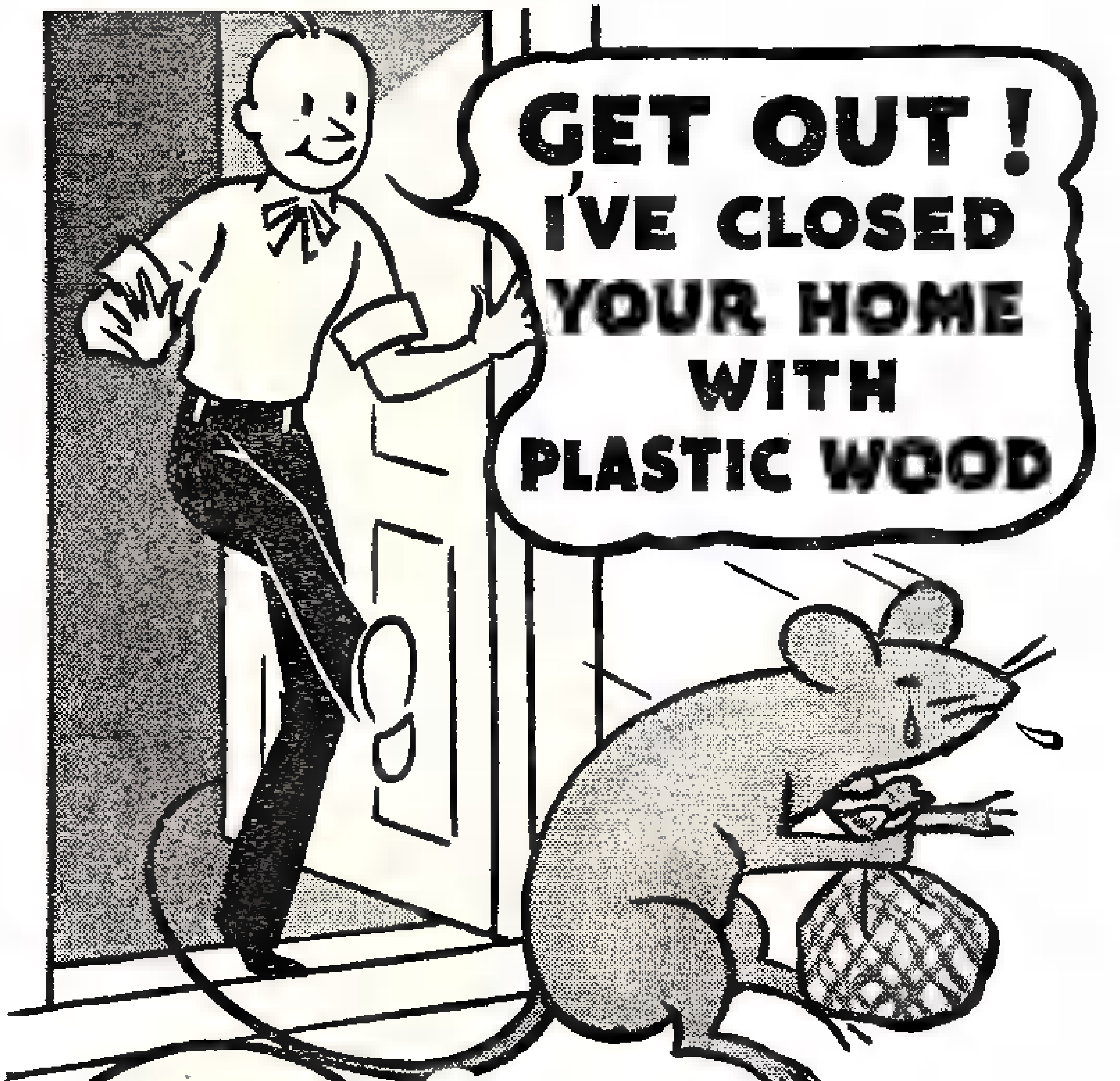
ADDRESS.................................... P. O......................

The LONG-EAKINS Company
Manufacturers of Carmelcrisp and Crispette Equipment
542 South High St. Springfield, Ohio

NEW REMINGTON PORTABLE

ONLY
10¢
A DAY

Not a used or rebuilt machine. A brand new regulation Remington Portable. Simple to operate. Full set of keys with large and small letters. Carrying case included free. Use it 10 days without cost. Write today. Say: How can I get new portable typewriter on 10-day free trial offer for only 10c a day? Remington-Rand Inc., Dept. 2803, Buffalo, N. Y.



WOOD IN CANS

Makes 1001 Home Repairs—Easy!

It's surprising how many things you can fix with this marvelous new discovery—Plastic Wood. It repairs damaged wood, fills holes in wood, plaster, repairs broken furniture, replaces rotted wood, resets loose casters and drawer pulls, etc.

It's simple, too, because Plastic Wood can be shaped and molded as easily as putty but it quickly dries to hard, permanent wood—wood that holds nails or screws without splitting—can be sanded, planed or carved, can be painted, varnished or lacquered—in fact, it can be handled and treated just like real wood. You can get this amazing Plastic Wood in 25c tubes and 35c cans at paint, hardware, department stores.

PLASTIC WOOD

NRA MEMBER U.S. WE DO OUR PART

PLASTIC WOOD

GET INTO BUSINESS for YOURSELF Making

MAGIC CHEESE CHIPS

Popular Priced **FOOD PRODUCT**

An exceptional business which may be started on a small scale and built up out of profits. Decidedly unusual. You can work at home. Chips come to you already made. Simply drop into hot grease and they're ready to eat—big, tasty, crispy, delicious! No complicated work. Experience unnecessary. Stores do your selling for you. You don't invest a cent until you've sold yourself on the possibilities. Then you can start with $8.50 investment. **Money-back guarantee goes with initial purchase.** Send for actual copies of orders from distributors showing how their business grows. A business for men and women alike. No super-salesmanship, no big investment. We furnish everything—display stands, advertising, etc. Get the exclusive rights for your locality. Write at once. Samples and particulars free.

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Quick Relief, or You Only Pay When Satisfied

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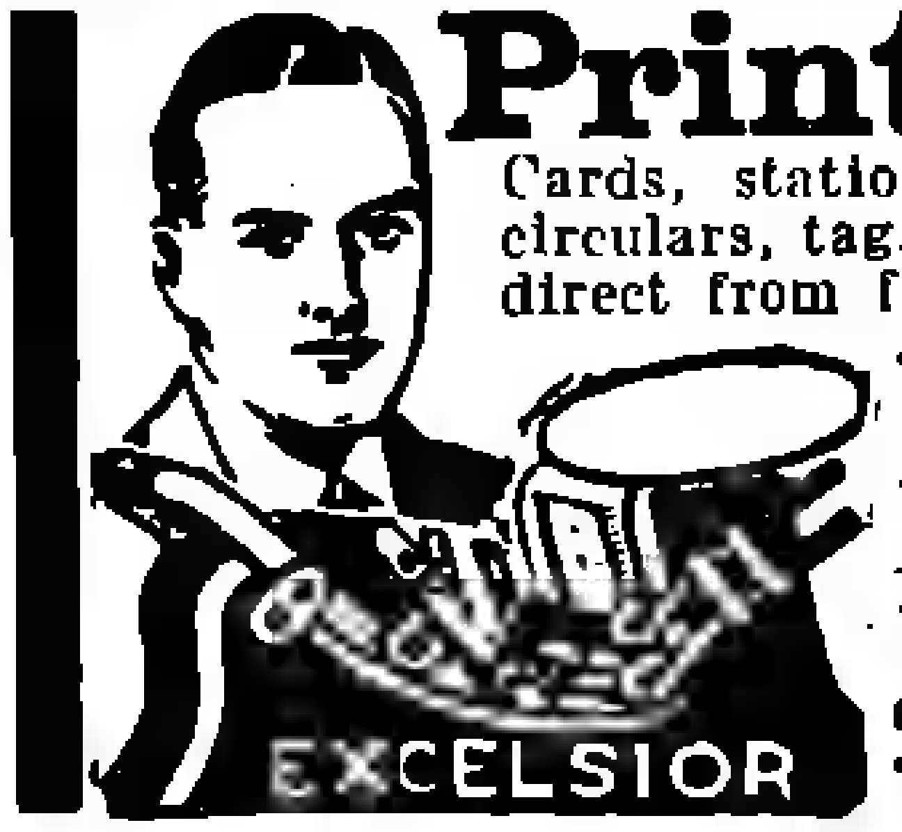
Print Your Own



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No man or woman can escape the harmful effects of tobacco. Don't try to banish unaided the hold tobacco has upon you. Join the thousands of inveterate tobacco users that have found it easy to quit with the aid of the Keeley Treatment.

KEELEY **Treatment For *Tobacco Habit* Successful For Over 50 Years**

Quickly banishes all craving for tobacco. Write today for Free Book telling how to quickly Free yourself from the tobacco habit and our Money Back Guarantee.

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I'D GIVE MY LAST CENT TO GAIN WEIGHT AND HAVE A REAL FIGURE
YOU DON'T HAVE TO BE SKINNY. I'LL TELL YOU HOW TO GAIN 10 LBS. IN A FEW WEEKS

New discovery! Fills out skinny figures

—so quick you're amazed

Astonishing gains in a few weeks with sensational new double tonic. Richest imported brewers' ale yeast, concentrated 7 times and combined with iron. Adds 5 to 15 lbs.—quick!

WHAT would *you* give to put on pounds of firm, attractive flesh in a few short weeks? Thousands have already done it—*inexpensively*—with this new discovery.

Doctors for years have prescribed yeast to build up health. But now this new discovery gives you far greater tonic results than ordinary yeast—builds health, and also puts on pounds of firm flesh—*and in a much shorter time.* Skin clears to new good looks, constipation vanishes, you get new pep.

Concentrated 7 times

This amazing new product, Ironized Yeast, is in pleasant tablet form. It is made from specially cultured *brewers' ale yeast* imported from Europe—the richest yeast ever known—which by a new process is concentrated 7 times—*made 7 times more powerful.*

But that is not all! This marvelous, health-building yeast concentrate is then *ironized* with three special kinds of iron which strengthen and enrich the blood, add abounding pep.

Day after day, as you take Ironized Yeast, watch ugly angles fill out, hollow chest develop, arms and legs round out pleasingly. Complexion becomes clear, indigestion disappears—new vitality comes.

Results guaranteed

No matter how skinny and weak you may be, this marvelous new Ironized Yeast should build you up in a few short weeks as it has thousands. If not delighted with the results of the very first package, your money back instantly.

Only be sure you get *genuine* Ironized Yeast and not some imitation that cannot give the same results. Insist on the *genuine*, with "IY" stamped on each tablet.

8 Lbs. in 3 Weeks

"In one week I gained 4 lbs., in 3 weeks 8 lbs. with Ironized Yeast. Tired feeling and constipation are gone, too." *Roy H. Tinney, Oklahoma City, Okla.*

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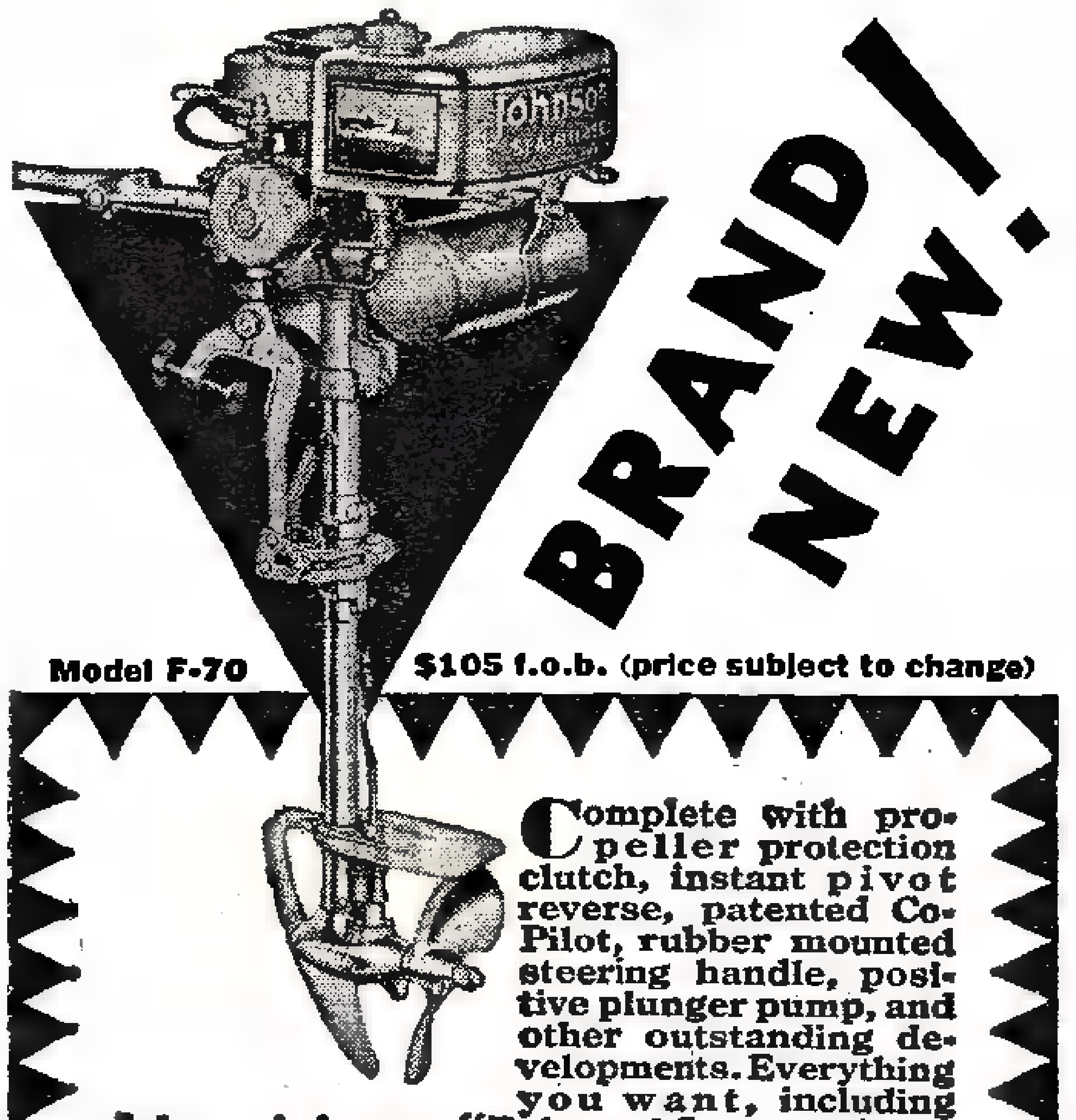
"I gained 15 lbs. in a month with Ironized Yeast." *Louise Adams, Friars Point, Miss.*

Special FREE offer!

To start you building up your health *right away*, we make this absolutely FREE offer. Purchase a package of Ironized Yeast at once, cut out the seal on the box and mail it to us with a clipping of this paragraph. We will send you a fascinating new book on health, "New Facts About Your Body", by a well-known authority. Remember, results are guaranteed with the very first package—*or money refunded.* At all druggists. Ironized Yeast Co., Dept. 565, Atlanta, Ga.



Model F-70 **$105 f.o.b. (price subject to change)**

Complete with propeller protection clutch, instant pivot reverse, patented Co-Pilot, rubber mounted steering handle, positive plunger pump, and other outstanding developments. Everything you want, including Johnson's famous "Balanced Construction," all at one low price—nothing extra to buy!

FREE Don't be without this instructive booklet, "It's Balanced Construction That Counts." Also your copy of the 1934 illustrated SEA-HORSE Handy Chart of motor specifications. Both free. Write

It's
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CONSTRUCTION
that
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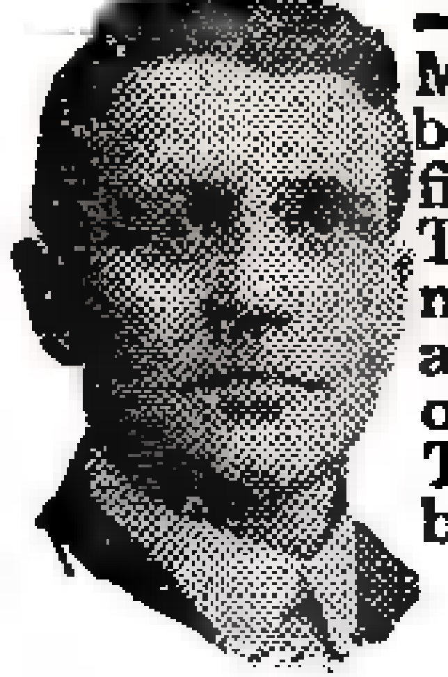
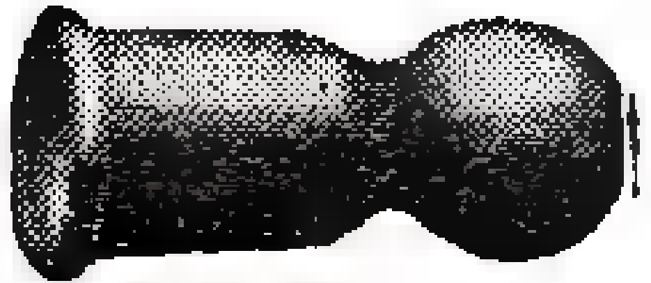
Johnson Motor Co., [illegible] Pershing Road, Waukegan, Ill. Canadian Johnson Motor Co. Ltd., Peterboro, Canada

JOHNSON SEA-HORSES

NO JOKE TO BE DEAF



—Every deaf person knows that—
Mr. Way made himself hear his watch tick after being deaf for twenty-five years, with his Artificial Ear Drums. He wore them day and night. They stopped his head noises. They are invisible and comfortable, no wires or batteries. Write for TRUE STORY. Also booklet on Deafness.



Artificial Ear Drum

THE WAY COMPANY
Hofmann Bldg. Detroit, Michigan

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You can learn all the modern dances—the latest Tango steps, the new Fox Trots, dreamy Waltzes, [illegible] Collegiate Steps, and popular Society Steps at home, easily and quickly. New chart method makes dancing as simple as A-B-C. No music or partner required. Don't be a wallflower. Learn to dance. Complete course—256 pages, 64 illustrations, sent on 5 Days' Free Trial. Equals $20.00 course. Send no money. Pay postman only $1.98, plus postage upon arrival. Money back if not delighted. Catalog Free.

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Start at $1850 a Year

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Start at [illegible] a Year

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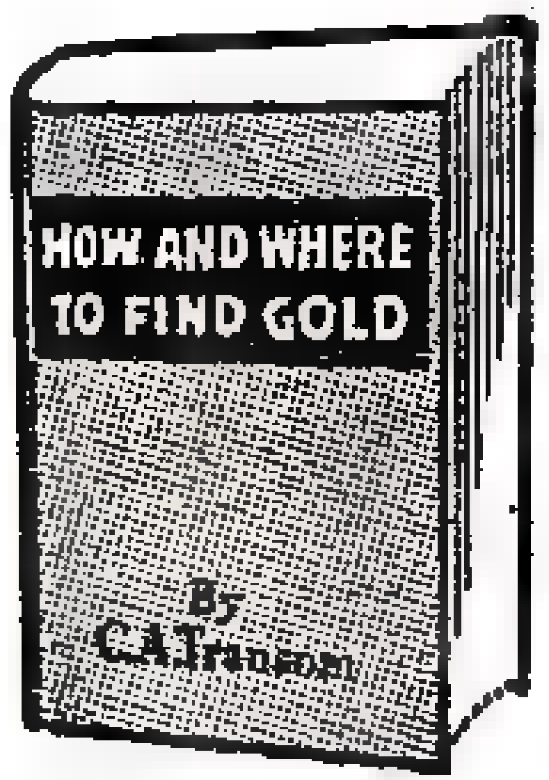
HOW AND WHERE TO FIND GOLD
By C.A. Transom

HOW AND WHERE TO FIND GOLD

A new prize book that tells prospectors, miners, and treasure hunters where to look for and how to find gold quickest. All the information is authentic, complete and easily understood. All the gold bearing rocks and minerals explained. New rich gold and silver locations given where fortunes may be made.

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sent with book order if you will send us names of three friends who might buy this book of exclusive information. **"How and Where to Find Gold."** There is no other book on gold like it, or that tells [illegible] as much. Learn how to be a prospector and find gold. Just 10 ounces a day will bring you [illegible] $320.00 daily. Send for this book now, and get the FREE MINERAL RODS for locating buried treasure. Attractively bound in black and gold. Price $2.50. Cash or sent C.O.D.
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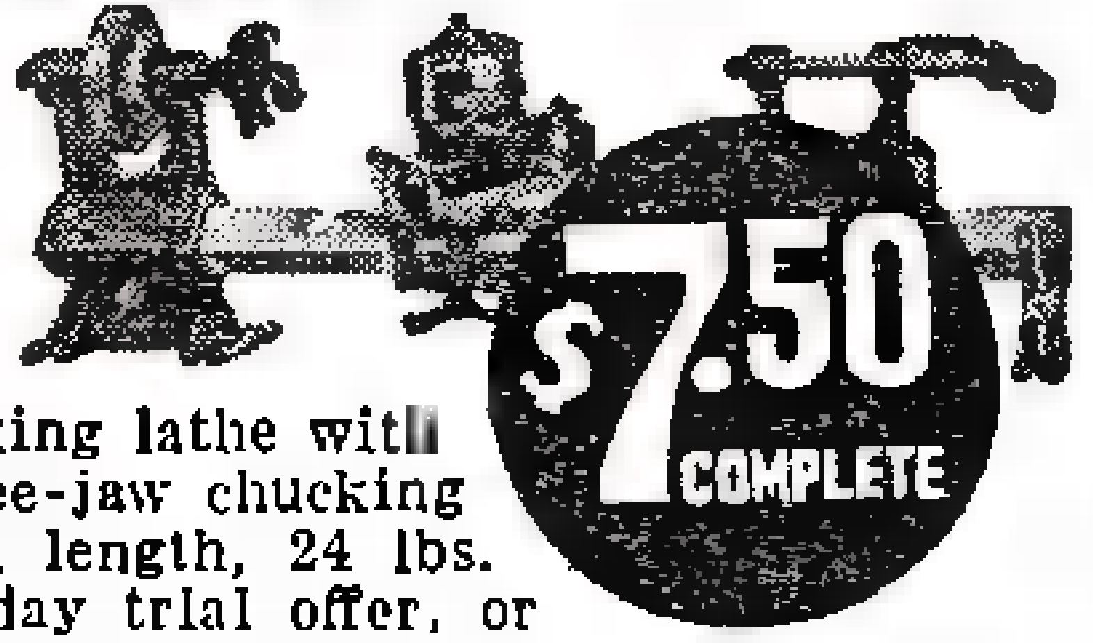
Page-Davis School of Advertising
3601 Michigan Avenue, Dept. 2055, Chicago, Illinois, U. S. A.

METAL-WORKING

LATHE



New designs and mass production methods make this amazing bargain possible. Complete metal working lathe with compound slide-rest, improved three-jaw chucking device, 6 in. swing, 24 in. overall length, 24 lbs. Send postcard for catalog and 10-day trial offer, or save time and send $1, balance plus express C.O.D. Wood-turning lathe $4.50. Extra bed lengths, 50c per ft. Attachments for milling, grinding, sanding, saw-table, etc., available at low prices.
AMERICAN MACHINE & TOOL CO., Dept. X, 200 Broadway, New York

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Health and Strength Course

An amazing NEW system of Health and Muscle Building that does not require the use of an apparatus or mechanical device to get the finest muscular development! Nothing like it ever offered before. Builds you inside, as well as out! Gives you a real he-man development in a few weeks' time. Results guaranteed! Sent C. O. D. or enclose $2.00 with order.

RALPH E. DOWELL
P. O. Box 244 **Grand Junction, Colorado**

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Write for free booklet describing "87 Plans for Operating a Successful Business of Your Own". Make from $20 to $100 a week starting in spare time at home. No peddling or house-to-house selling. Booklet sent free, and without obligation. Write for your copy today.

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CRIME DETECTION
SECRET SERVICE
AND
FINGER PRINTS

SECRET SERVICE BOOK FREE

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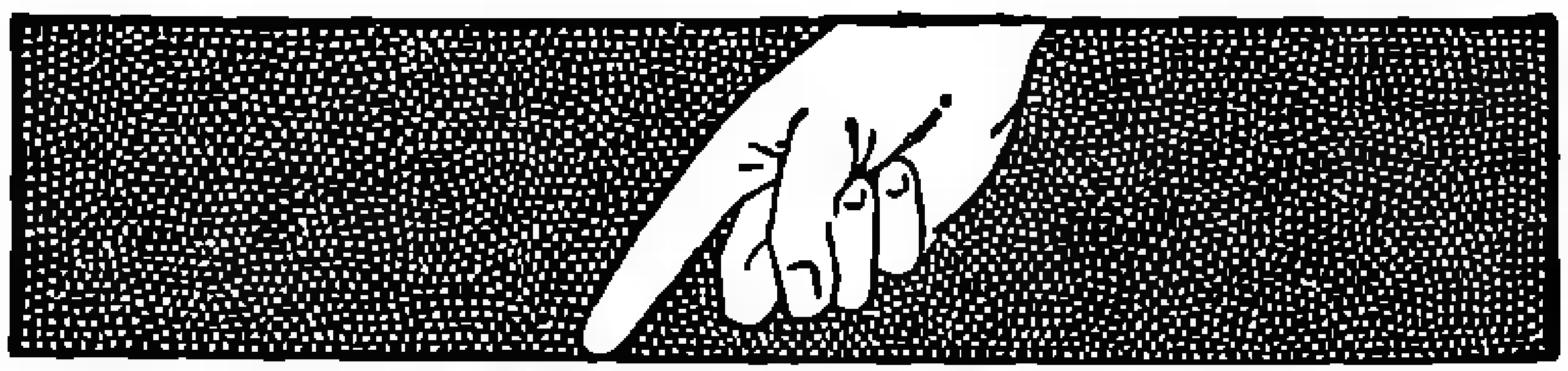
No Money Down—Actual Crime Cases—
If You Act Quick!—We will send you this stirring book on Crime Detection, Secret Service and Identification Work for 30 days free reading. Send no money. If you decide to keep it, then send only $1.00. If not, return it. WRITE TODAY. **Not sent to boys under 17 years of age.**

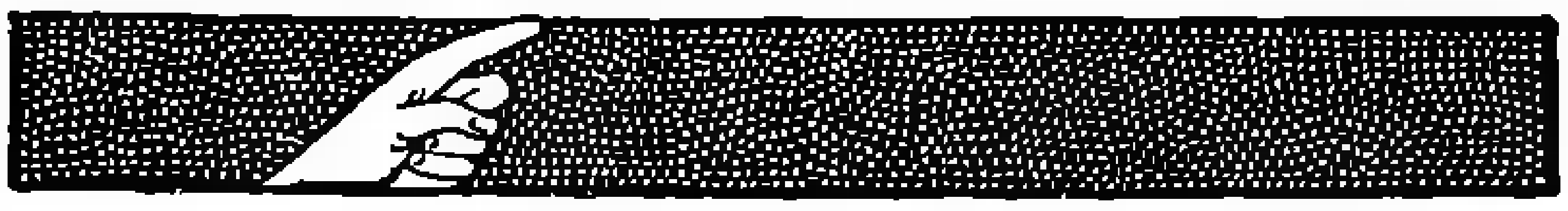
T. G. Cooke, Book Dept. 23-55, 1920 Sunnyside Ave., Chicago



AGENTS..Smash Go Prices!

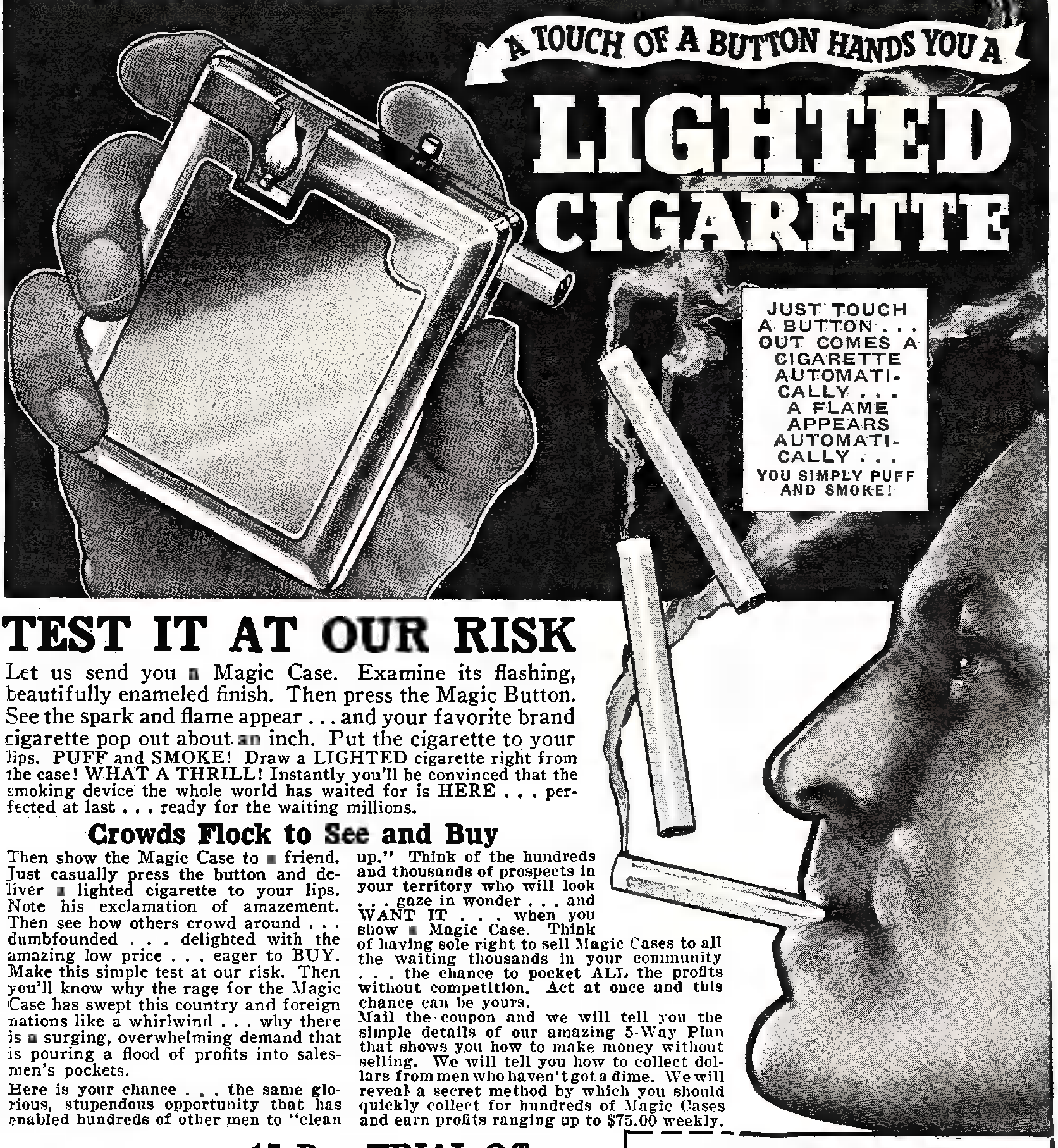
Santos Coffee 12c lb. 4-oz. Vanilla 8½c. $1.00 size Tonic 14c. Razor Blades [illegible] for 8½c. 100 sticks Chewing Gum 12c. 150 other bargains. Experience unnecessary.

Write CARNATION COMPANY MN-2 ST. LOUIS, MO.



LOOK MEN BRAND NEW KNOCKOUT INVENTION

A TOUCH OF A BUTTON HANDS YOU A LIGHTED CIGARETTE



JUST TOUCH A BUTTON . . . OUT COMES A CIGARETTE AUTOMATICALLY . . . A FLAME APPEARS AUTOMATICALLY . . . YOU SIMPLY PUFF AND SMOKE!

TEST IT AT OUR RISK

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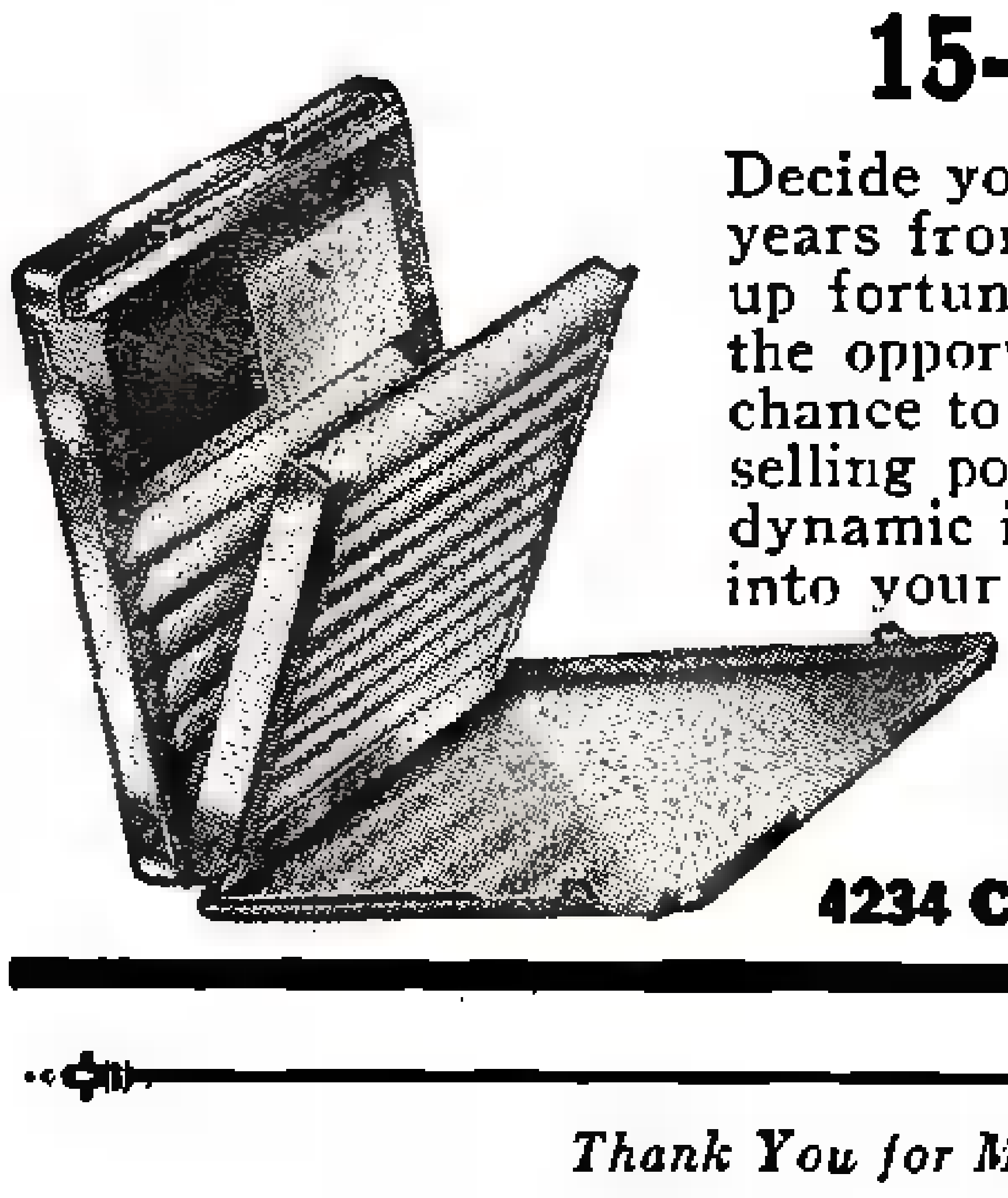
Here is your chance . . . the same glorious, stupendous opportunity that has enabled hundreds of other men to "clean up." Think of the hundreds and thousands of prospects in your territory who will look . . . gaze in wonder . . . and WANT IT . . . when you show a Magic Case. Think of having sole right to sell Magic Cases to all the waiting thousands in your community . . . the chance to pocket ALL the profits without competition. Act at once and this chance can be yours.

Mail the coupon and we will tell you the simple details of our amazing 5-Way Plan that shows you how to make money without selling. We will tell you how to collect dollars from men who haven't got a dime. We will reveal a secret method by which you should quickly collect for hundreds of Magic Cases and earn profits ranging up to $75.00 weekly.



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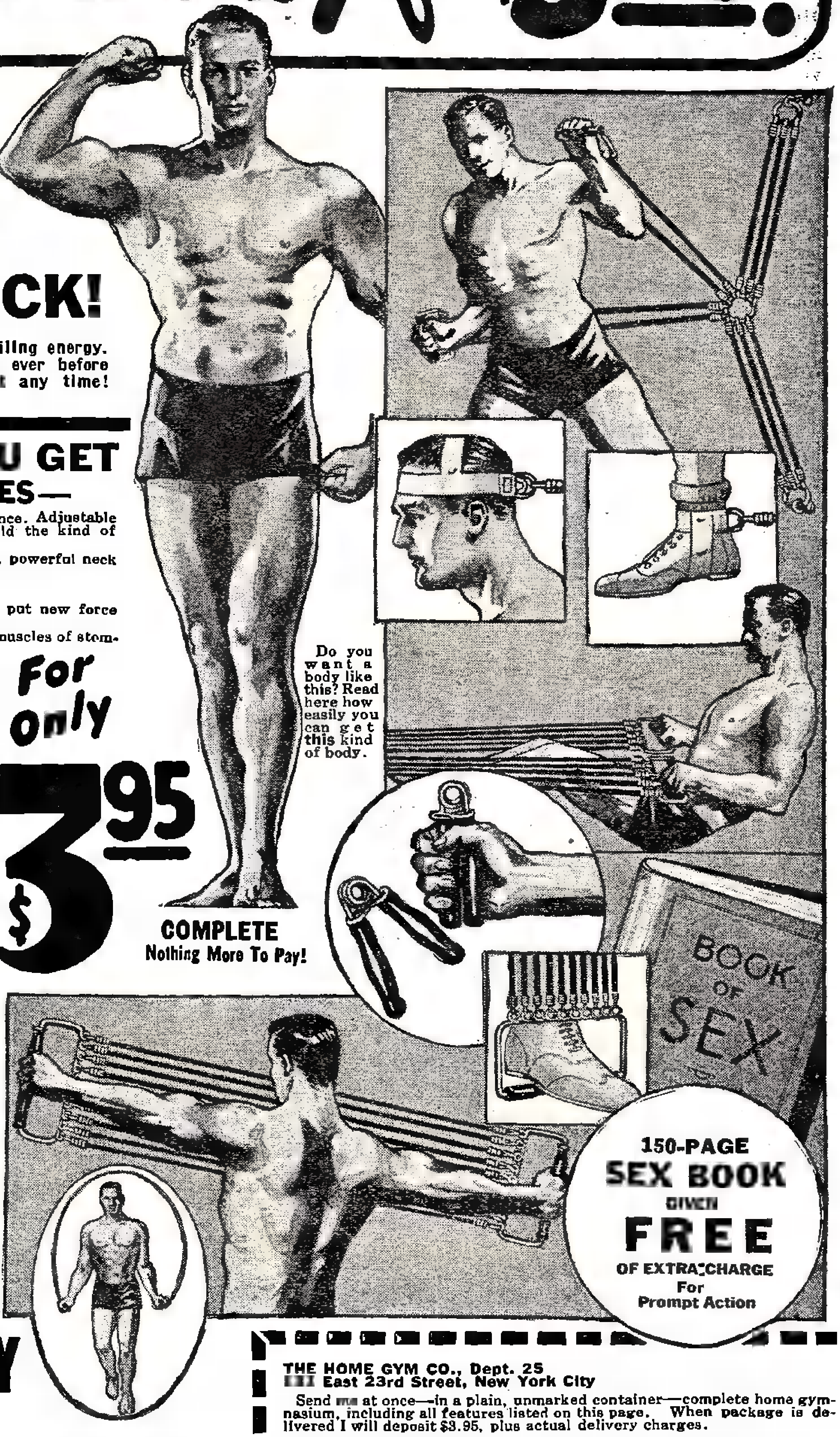

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131 East 23rd Street, New York City

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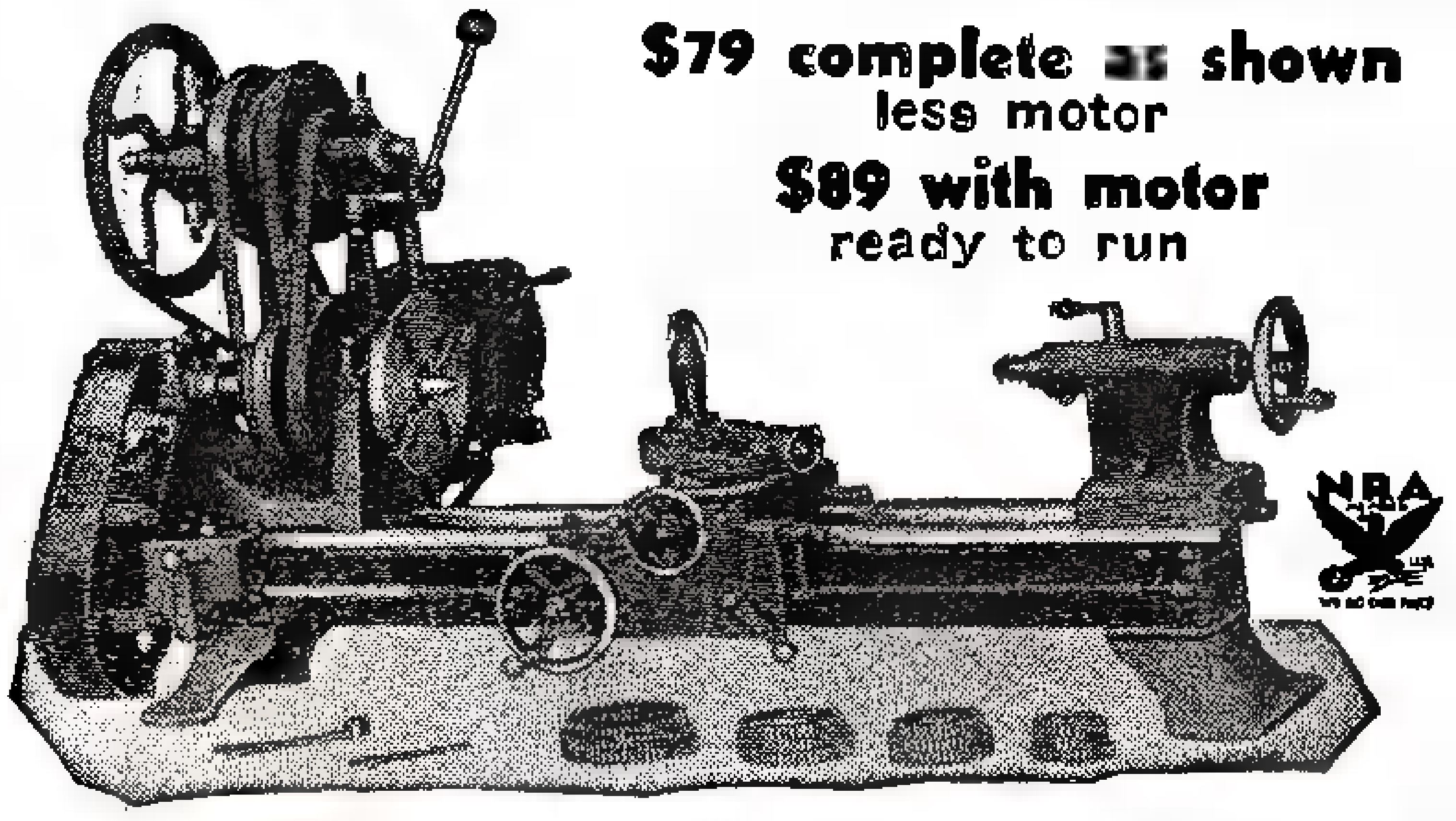

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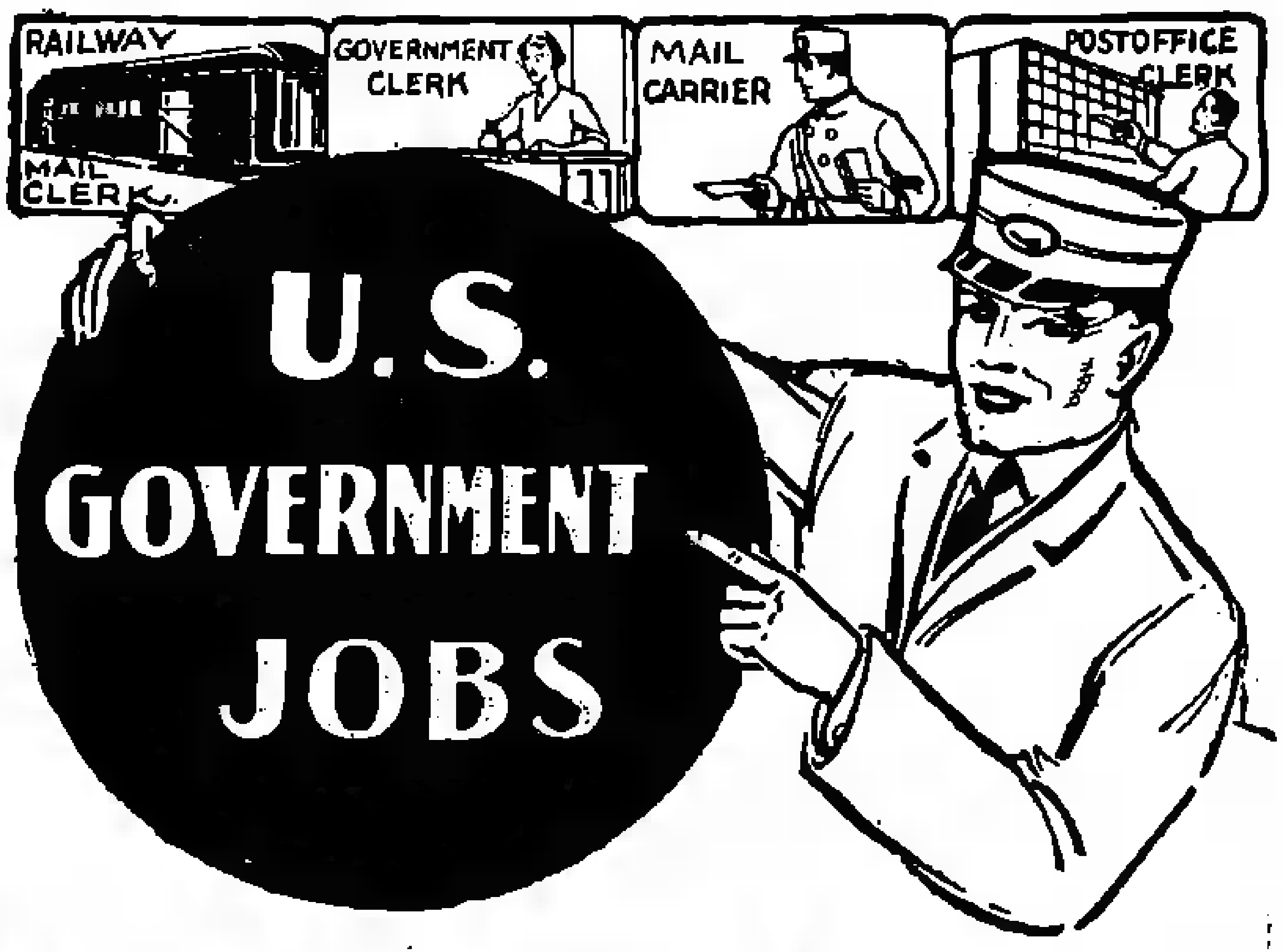

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Railway Postal Clerks, like all Government employees, have a yearly vacation of 15 working days (about 18 days). On long runs, they usually work 3 days and have 3 days off duty or in the same proportion. During this off duty and vacation their pay continues just as though they were working. They travel on a pass when on business and see the country. When they grow old, they are retired with a pension.

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Start $2100 year. Men 21 to 45. Work connected with examining immigrants and merchandise entering the country from foreign ports.

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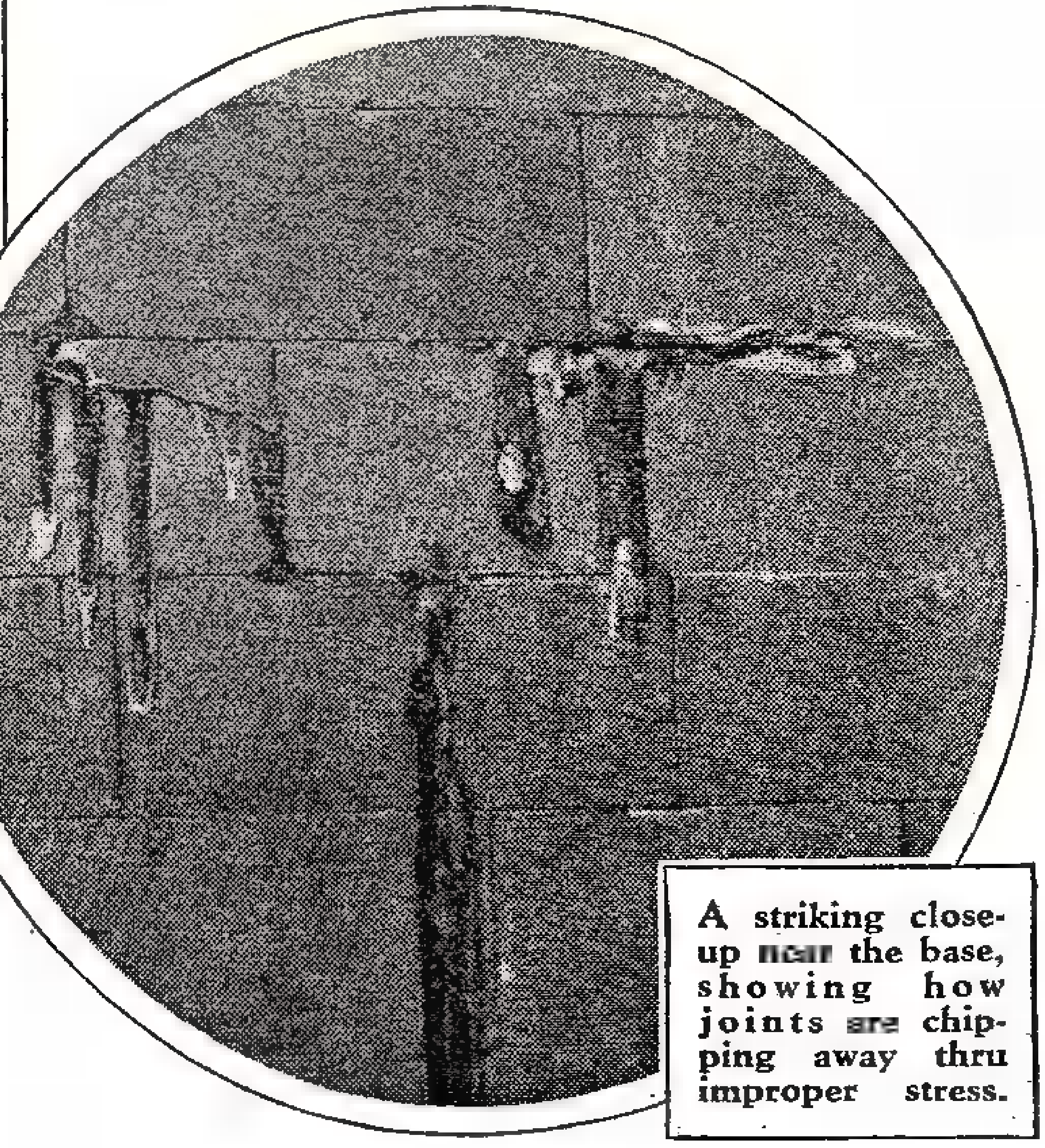
WILL the WASHINGTON

Secretly probing threatened destruction of America's famous memorial, federal experts unearthed a host of startling facts. Here, for the first time, is the amazing, inside story!

Cherry blossoms—and potential tragedy. Is the famous obelisk doomed by deterioration of inferior marble? Note the discolored base, showing area under observation.



A striking close-up near the base, showing how joints are chipping away thru improper stress.

IS THE Washington monument crumbling? Are its marble sides deteriorating to such an extent that visitors are endangered by falling stone? Is America's most famous memorial destined to come crashing down upon the nation's capital city?

These disturbing questions confronted federal officials not long ago. A large number of visitors had been waiting to enter the memorial when a missile suddenly hurtled downward, striking with a crash near the base of the structure and narrowly missing two people standing in line.

A chunk of marble as big as the average man's fist had chipped away from a section of the monument less than 150 feet from the ground!

The narrowly averted tragedy galvanized government officials into action. Other fragments had fallen previously. The next missile might take its toll of human life. And always there was the whispered threat that perhaps the entire monument might come crashing down with untold disaster in its wake.

A secret investigation was quickly launched to determine the causes of the memorial's deterioration. An appropriation of $100,000 was rushed through by the Public Works Administration. Since then federal engineers and stone specialists from the Bureau of Standards have worked tirelessly, carrying on intensive tests which have revealed a host of startling facts.

At first investigators were not sure whether the chipping away of the marble was caused by inferior quality of the stone, by the natural weathering process or by improper distribution of weight.

Survey of the site revealed that the round top hill on which the monument stands is exceptionally windy. Like the famous Flatiron building in New York City, the shape of the memorial acts with the air currents to produce severe whirlwinds. Experts wondered whether the terrific lashing of these winds against the shaft would be sufficient to account for the deterioration.

Seeking an answer to their questions, scientists first considered the history and the makeup of the monument. The face of the shaft is of marble while the interior facing is of granite. It is 555 feet one-eighth inches high, 55 feet one and a half inches wide at the base outside and 25 feet inside. The walls are 15 feet one-quarter inch thick at the base and 18 inches at the top. The taper of the shaft is one-fourth inch to one foot.

The total weight of the monument is

MONUMENT CRASH?

by JAMES NEVIN MILLER

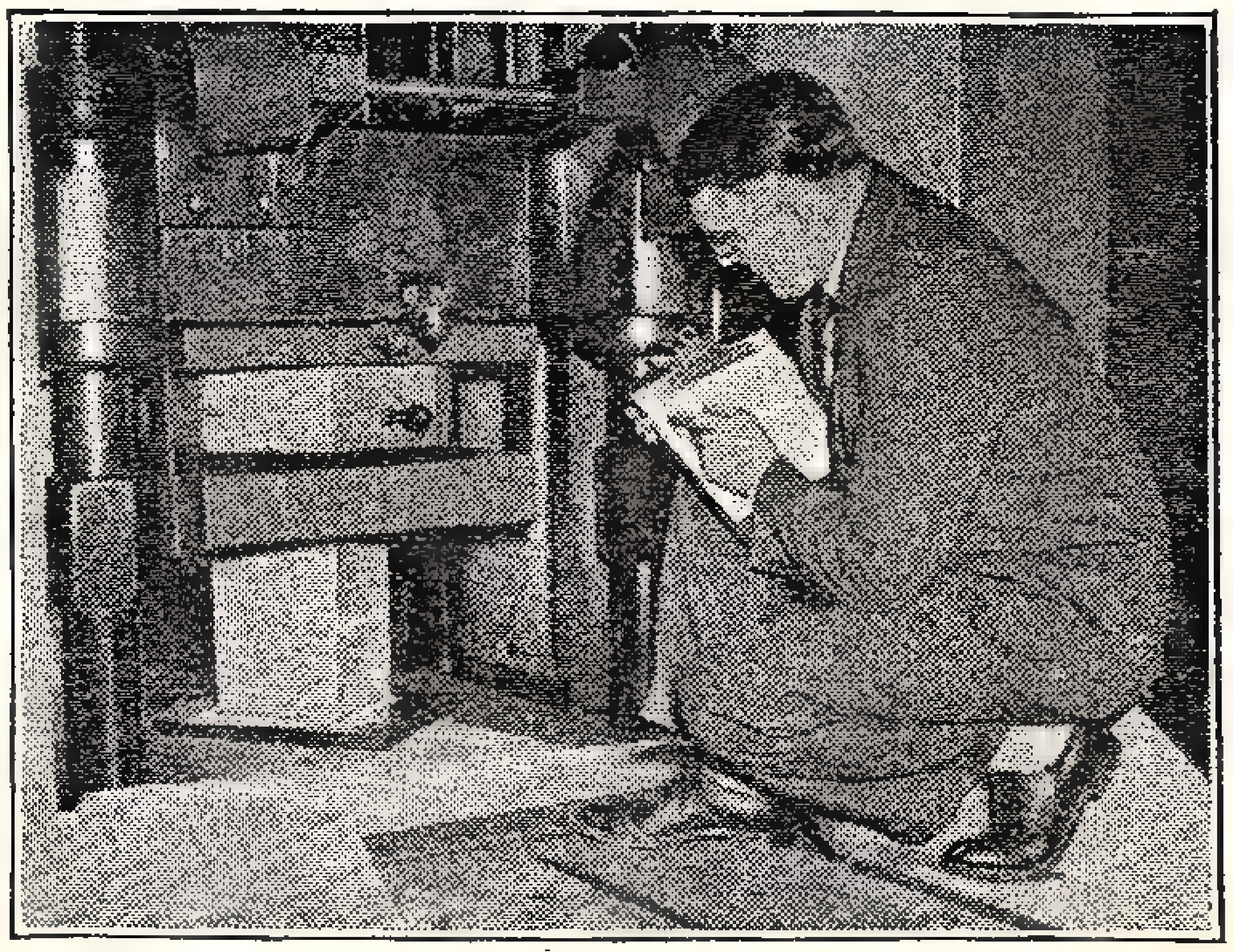
81,120 tons. There are 898 steps, 50 landings and 8 windows at the top. There is an electric elevator with a carrying capacity of 30 persons.

The memorial was constructed to a height of about 153 feet by the Washington Monument Society, organized October 31, 1833. The cornerstone, a block of marble weighing 24,500 pounds, was quarried and presented to the Society by Thomas Symington of Baltimore, Md. It was laid July 4, 1848, under the auspices of the society.

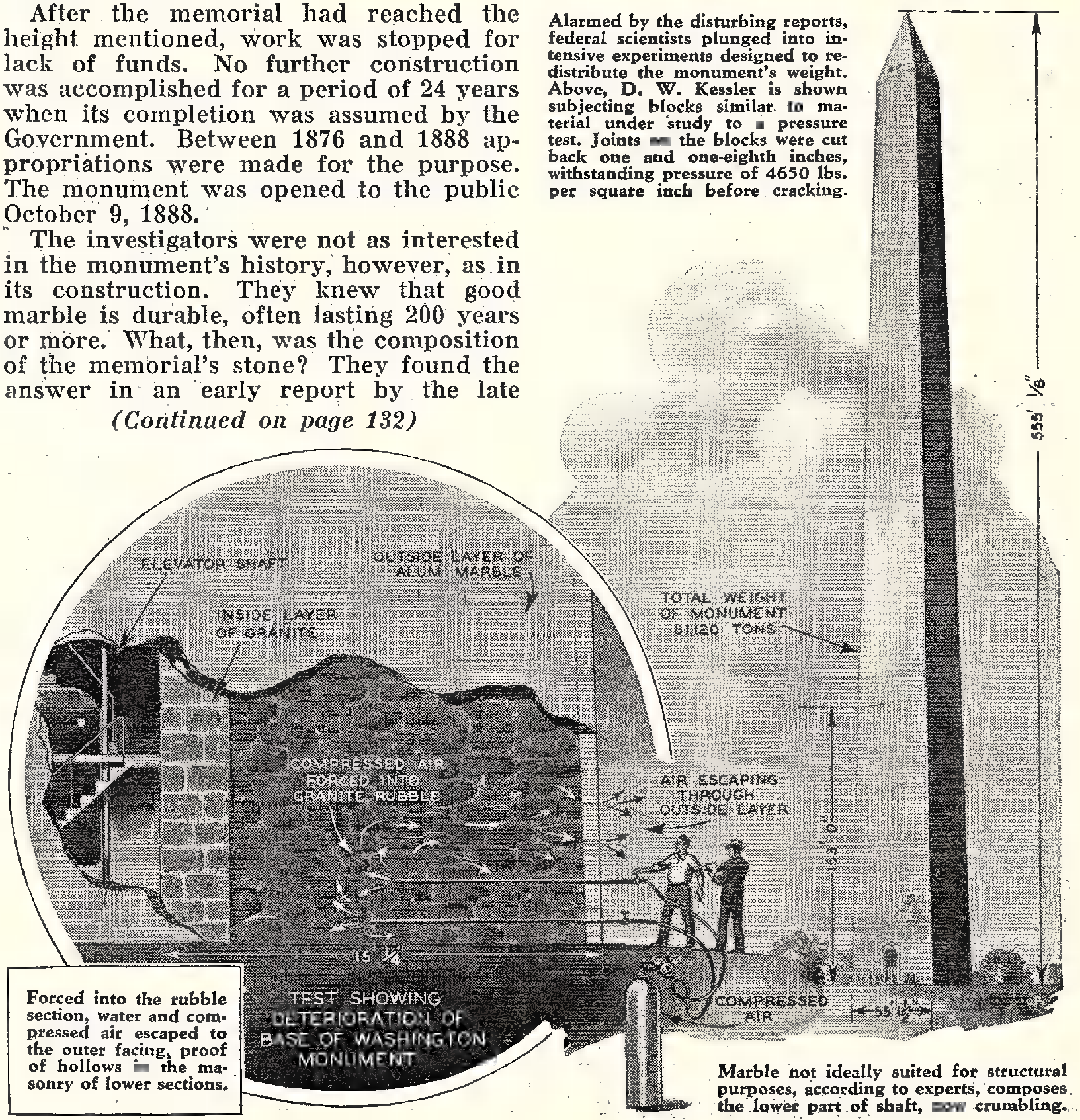
After the memorial had reached the height mentioned, work was stopped for lack of funds. No further construction was accomplished for a period of 24 years when its completion was assumed by the Government. Between 1876 and 1888 appropriations were made for the purpose. The monument was opened to the public October 9, 1888.

The investigators were not as interested in the monument's history, however, as in its construction. They knew that good marble is durable, often lasting 200 years or more. What, then, was the composition of the memorial's stone? They found the answer in an early report by the late

(Continued on page 132)



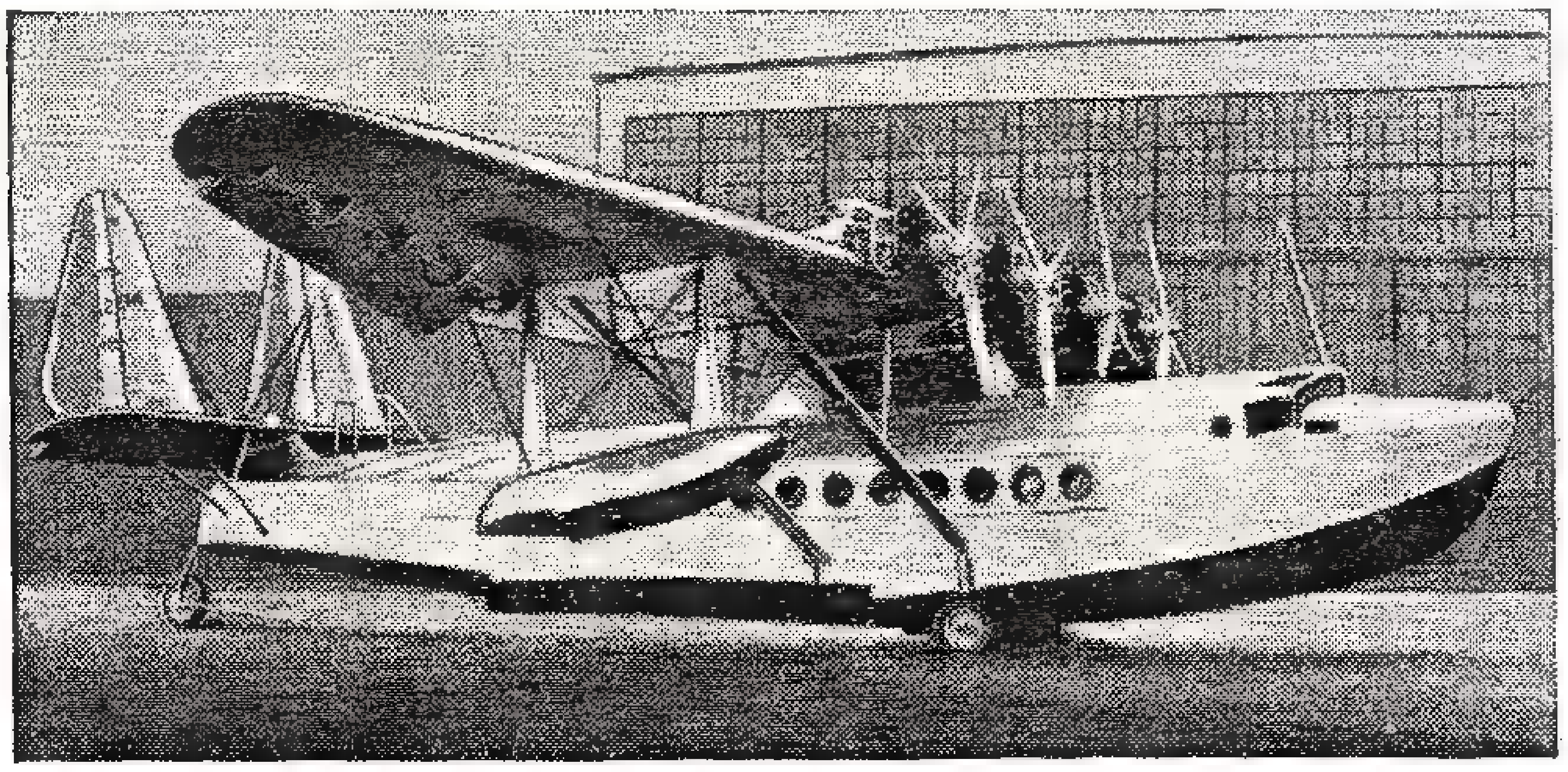
Alarmed by the disturbing reports, federal scientists plunged into intensive experiments designed to redistribute the monument's weight. Above, D. W. Kessler is shown subjecting blocks similar to material under study to [illegible] pressure test. Joints [illegible] the blocks were cut back one and one-eighth inches, withstanding pressure of 4650 lbs. per square inch before cracking.


ELEVATOR SHAFT
OUTSIDE LAYER OF ALUM MARBLE
INSIDE LAYER OF GRANITE
COMPRESSED AIR FORCED INTO GRANITE RUBBLE
15' 1/4"
TEST SHOWING DETERIORATION OF BASE OF WASHINGTON MONUMENT
TOTAL WEIGHT OF MONUMENT 81,120 TONS
AIR ESCAPING THROUGH OUTSIDE LAYER
153' 0"
555' 1/8"
COMPRESSED AIR
55' 1/2"

Forced into the rubble section, water and compressed air escaped to the outer facing, proof of hollows [illegible] the masonry of lower sections.

Marble not ideally suited for structural purposes, according to experts, composes the lower part of shaft, now crumbling.

32 Passenger Mystery Plane Built to Span the Atlantic



View of recently completed Sikorsky S-42, country's largest flying boat, which is soon to inaugurate a regular trans-Atlantic passenger and airmail service. The gigantic ship can carry 32 passengers and 1,000 lbs. mail.

A GIGANTIC Sikorsky S-42 flying boat, the largest ever built in this country, has been completed amid the greatest of secrecy in Stratford, Connecticut.

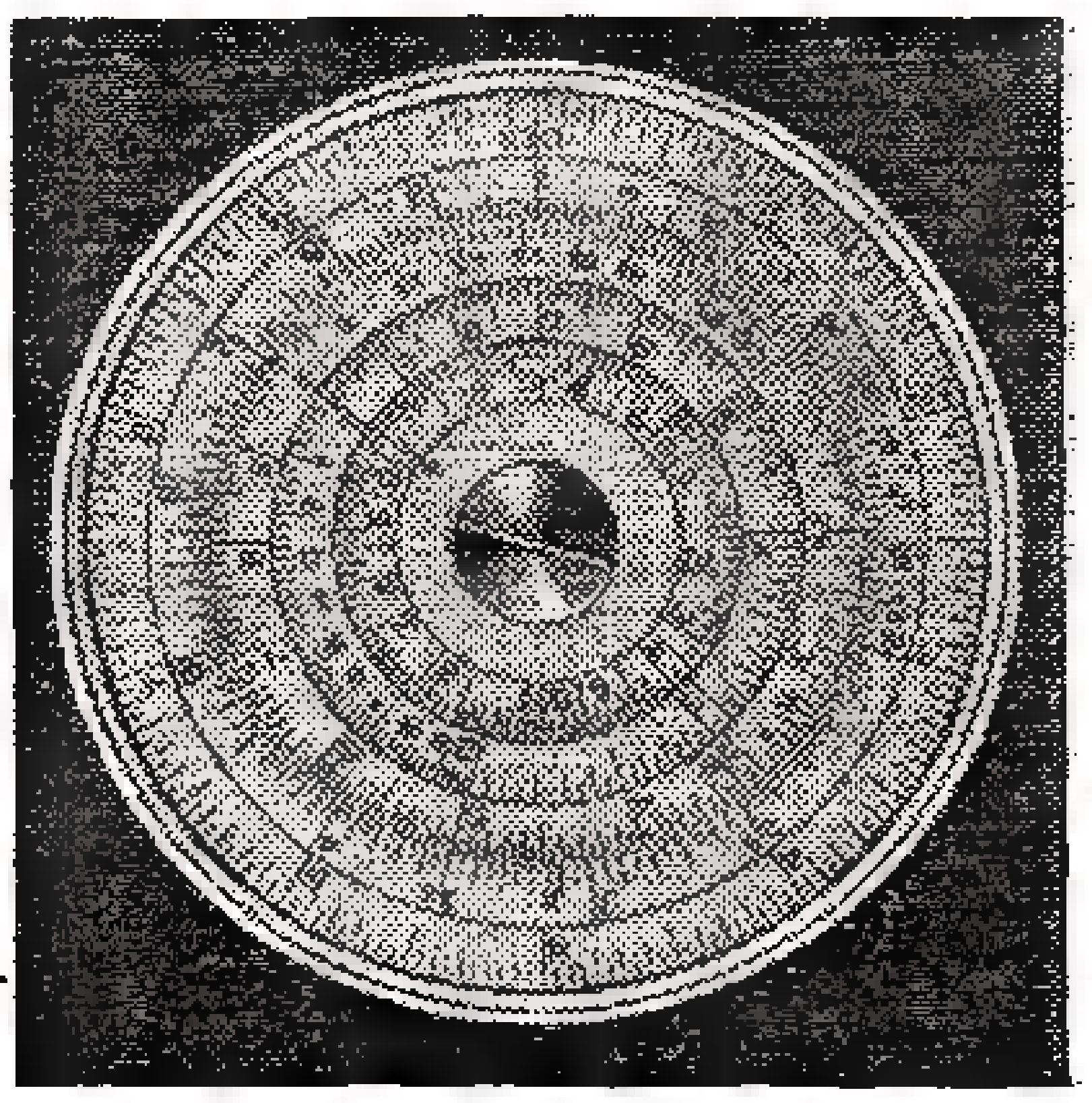
It is proposed to use this huge flying boat for the first regular passenger and airmail service across the Atlantic Ocean.

The air liner can carry 32 passengers and over 1,000 pounds of mail easily, having a cruising range of 2,500 miles with this loading.

Four radial engines built into the upper wing give this craft an unusually high cruising speed. Three bladed adjustable pitch propellers of highest possible efficiency are used.

Many new features were used to make this the safest air liner ever built.

Circular Slide Rule Fits in Pocket



German silver circular slide rule is small enough to fit vest pocket, but more accurate than standard 10-inch straight rule.

A NEW circular slide rule but 2¾ inches in diameter is claimed to have an accuracy even better than that of the ordinary 10-inch rule. Scales are engraved on nickel silver discs, making rule almost indestructible. There are nine scales.

"Overland Jack" Lives in Wagon

THOUGH "Overland Jack," well known character in Texas, lost both his legs while a schoolboy, he has never admitted defeat. In his tiny camping wagon drawn by four faithful goats he has toured 19 states in the Union, and every county of Texas, making his own living and enjoying life. All sleeping and cooking equipment is stored in rear of wagon. On level roads, "Overland Jack" sometimes uses but one goat.

"Overland Jack" of Big Sandy, Texas, lives and works in this tiny farm wagon drawn by his goat.

Explorer, Wife Use Tandem Bike

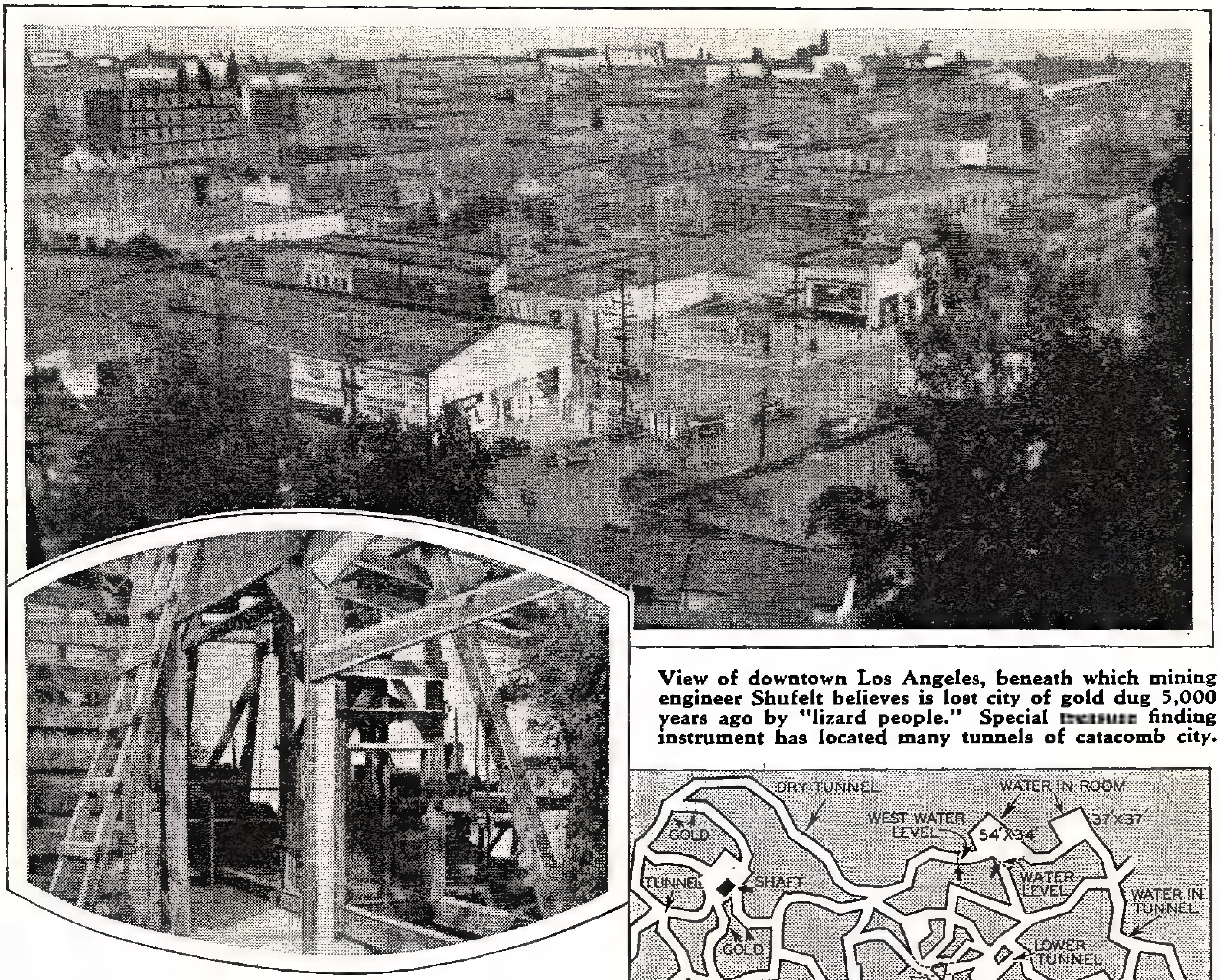
John Carveth Wells and his wife, headed for Abyssinia, start out from London on tandem bicycle.

JOHN CARVETH WELLS, son of the famous explorer, accompanied by his wife, left London recently on a tandem bike, headed for Abyssinia.

They plan to travel through Europe in this fashion, and search for the fabulous lost treasure of the Queen of Sheba on arrival at their destination.

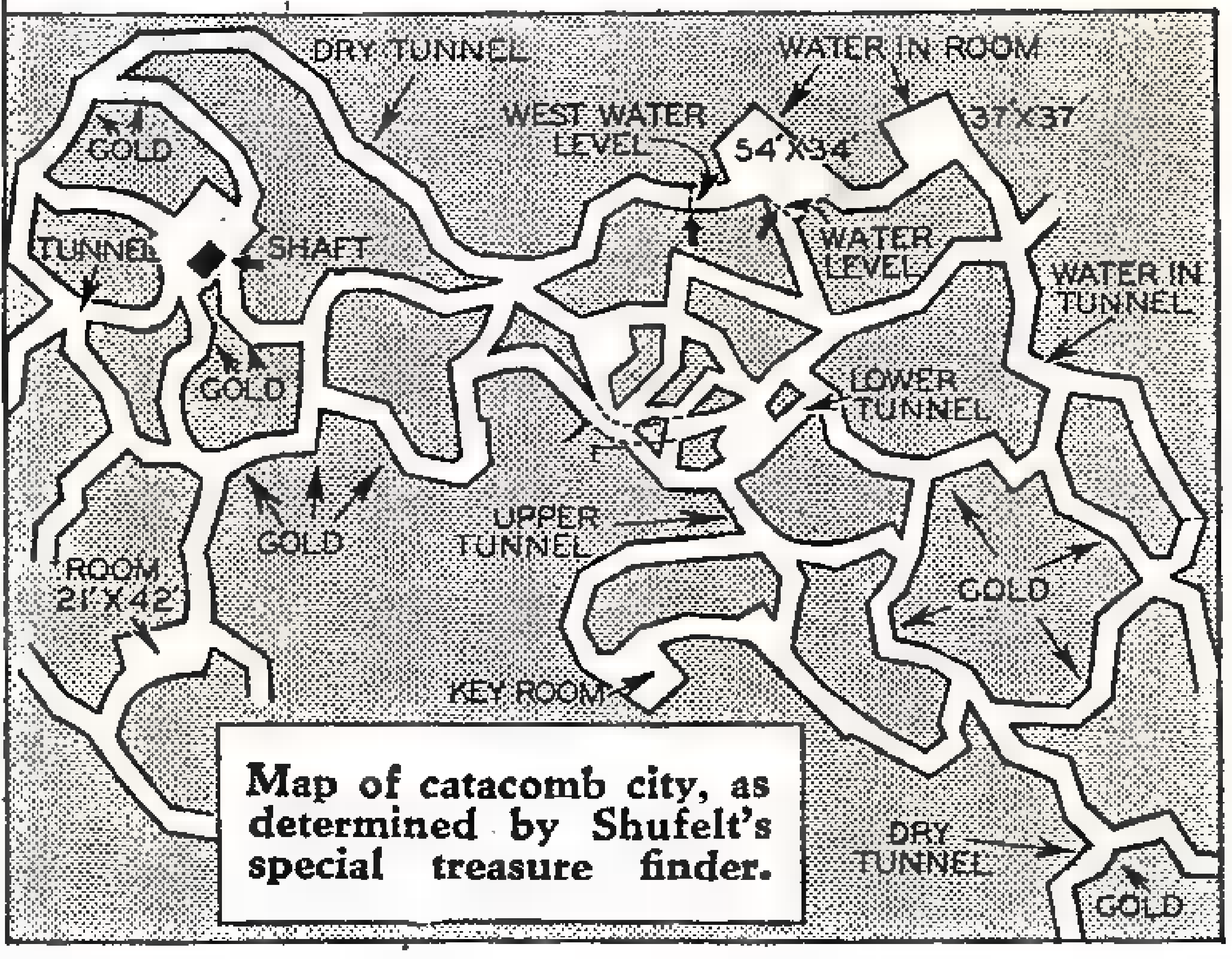
This treasure horde is reputed to be buried somewhere in the deserts of Abyssinia. Wells, after studying many old documents, believes he has located the cache.

Seek Lost Gold City Under Los Angeles



View of downtown Los Angeles, beneath which mining engineer Shufelt believes is lost city of gold dug 5,000 years ago by "lizard people." Special treasure finding instrument has located many tunnels of catacomb city.

Derrick structure at mouth of shaft engineers are sinking on hill overlooking downtown Los Angeles to reach lost city.



Map of catacomb city, as determined by Shufelt's special treasure finder.

THE lost city of the "lizard people," believed to be far beneath the streets of Los Angeles, has been located, G. Warren Shufelt, mining engineer, claims.

Using a treasure finding device of his own design, Shufelt has explored a large area of downtown Los Angeles.

"I knew I was over a pattern of tunnels," he declared, "and mapped out their course, the positions of the larger rooms, and the location of the deposits of gold."

He has secured financial backing for his underground explorations, and is now directing a group of men who are sinking a shaft in the heart of Los Angeles, just above what is thought to be the "key room" of the city of catacombs.

The shaft is already down to 250 feet. The group plan to go down to at least 1,000 feet before abandoning operations.

Legend has it that about 5,000 years ago three of these underground cities were burrowed out by a tribe of Indians after a great tongue of fire had "come out of the southwest destroying all life in its path." The labyrinths were dug to escape future fires.

The legend, as told Shufelt by an educated Hopi Indian, says the lost city was dug with powerful chemicals, without the need for removing either earth or rock.

The city was laid out in the shape of a lizard, this reptile being regarded as the symbol of long life.

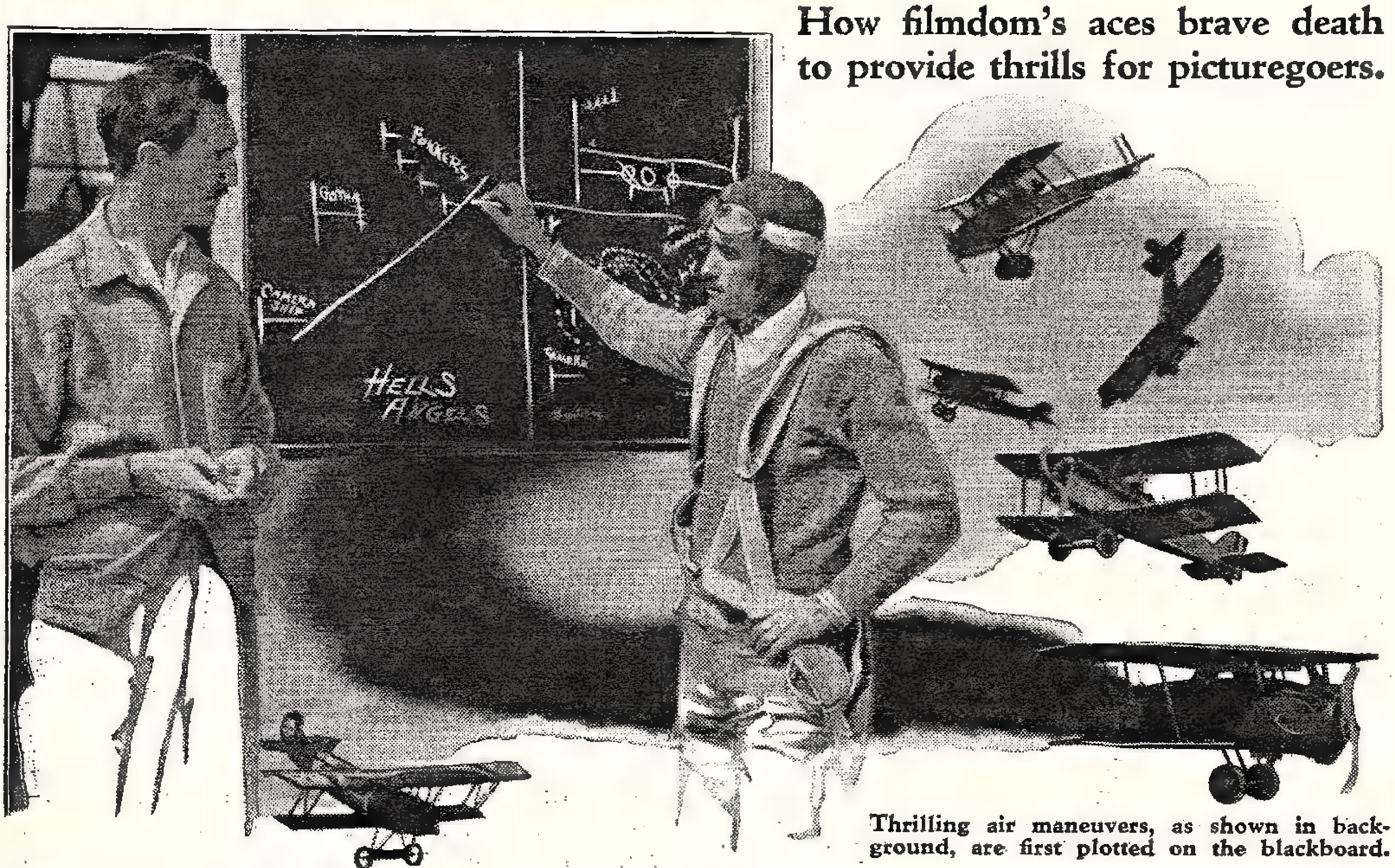
According to the legend, all records were kept on gold tablets four feet long and 14 inches wide. Shufelt believes he has located thirty-seven of these tablets.

The apparatus used in locating the tunnels consists essentially of a plummet attached to a copper wire, and held by the hand inside a cylindrical glass case.

The plummet sways continually, its action depending upon the nature of the minerals or earth structure below.

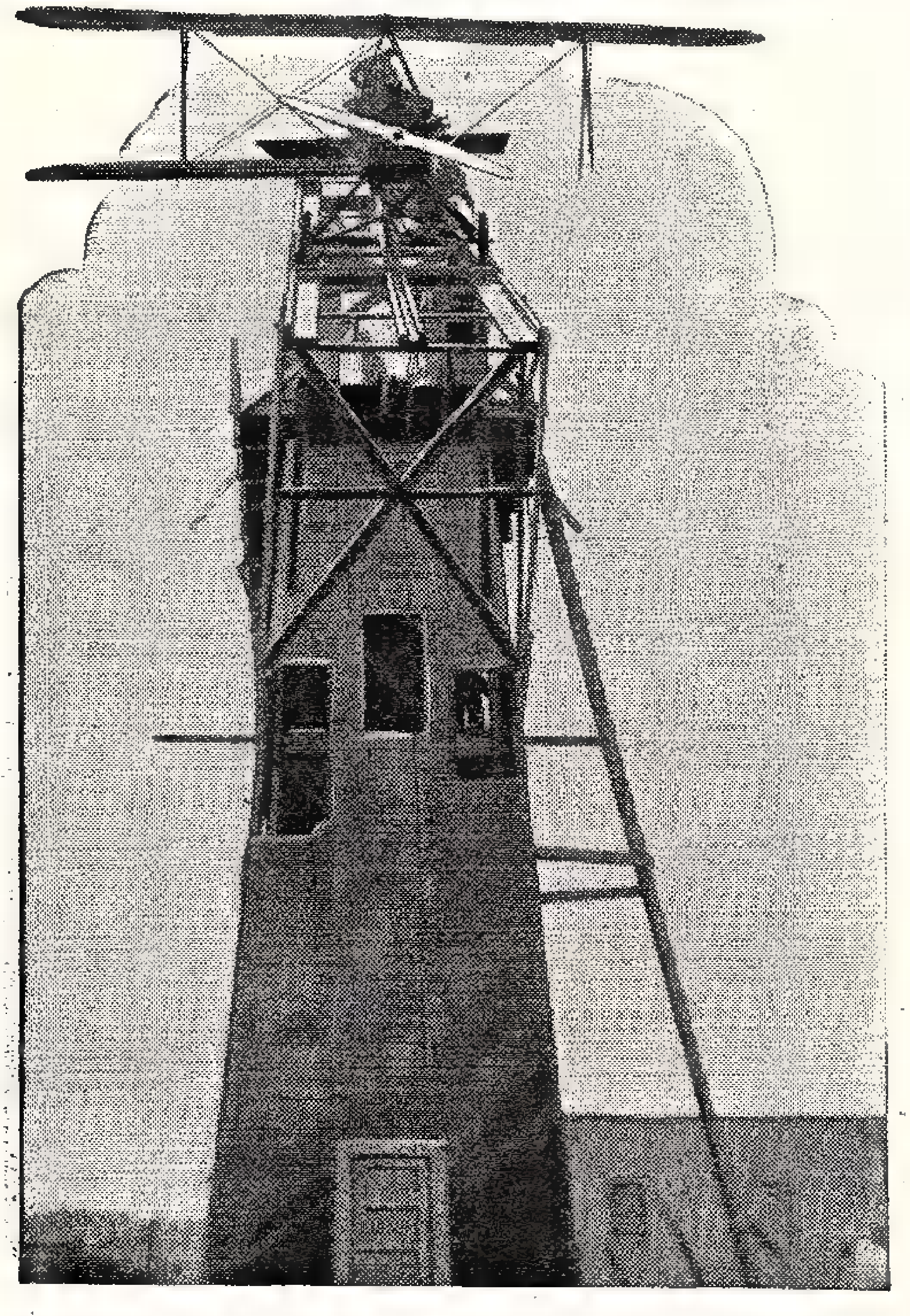
CRASHING AIRPLANES

How filmdom's aces brave death to provide thrills for picturegoers.



Freddie Fleck, left, assistant director, and Harry Peary, chief cameraman, diagram the action for one of the sensational dog fights featured in "Hell's Angels."

Thrilling air maneuvers, as shown in background, are first plotted on the blackboard.



Needless risk of life is overcome by this catapult which launches pilot-less planes down a wooden runway to their crashing point. (See photograph on opposite page.)

MOTOR idling, prop turning over lazily, a pilot-less plane stands on the airport runway awaiting passengers. Suddenly the motor roars into life, the prop becomes a flashing circle of steel and the plane leaps down the field. A passenger has accidentally tripped the throttle and the ship is running wild!

The staccato roar of a second plane fills the air. Another pilot guns his ship to the full to head off the runaway. At mile-a-minute speed they hurtle toward each other. A resounding crash and the two airplanes are locked in a splintering death embrace. Again two pilots have gambled with eternity to supply a movie thrill—and miraculously escaped.

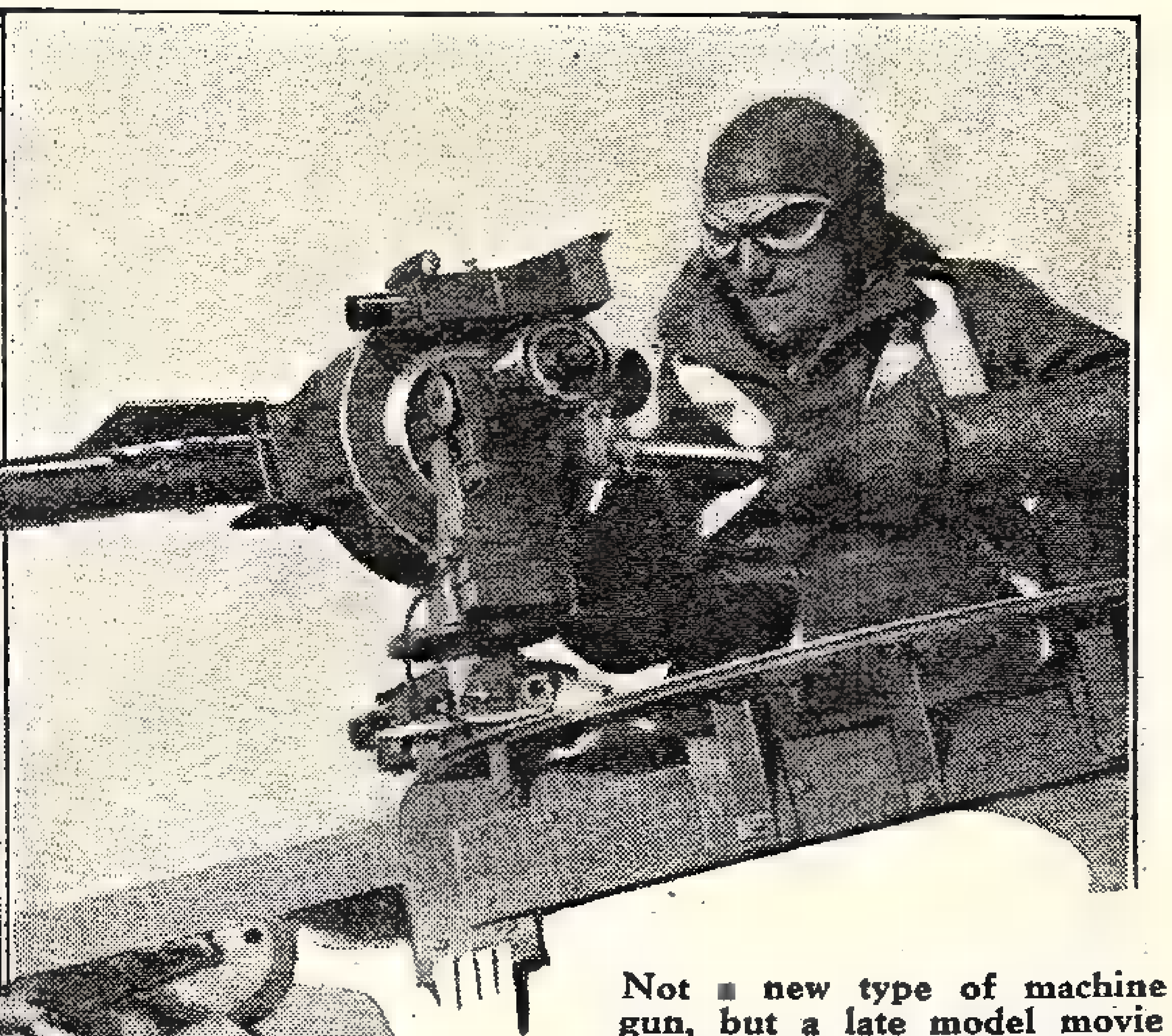
Oddly enough, the foregoing stunt, a scene from "Central Airport," although confined entirely to the ground, was more hazardous than various breath-taking shots which are filmed in the air.

One of the spectacular crashes which highlighted "The Lost Squadron," for instance, was entirely devoid of personal danger, albeit thrilling in the extreme. The plot of the story called for the unnecessary death of a stunt flyer who was to crash a plane in a village street immediately before the cameras. To accomplish the feat, a pilot-less plane was shot from a gigantic catapult to its crashing point. The only hitch in the proceedings occurred when a

for the MOVIES

by JAMES BOWLES

In crash sequences calling for closeups of the actors, planes are frequently strung on wires, a trick once used extensively to simulate collisions in early film production.



Not a new type of machine gun, but a late model movie camera, especially devised for the shooting of aerial scenes.

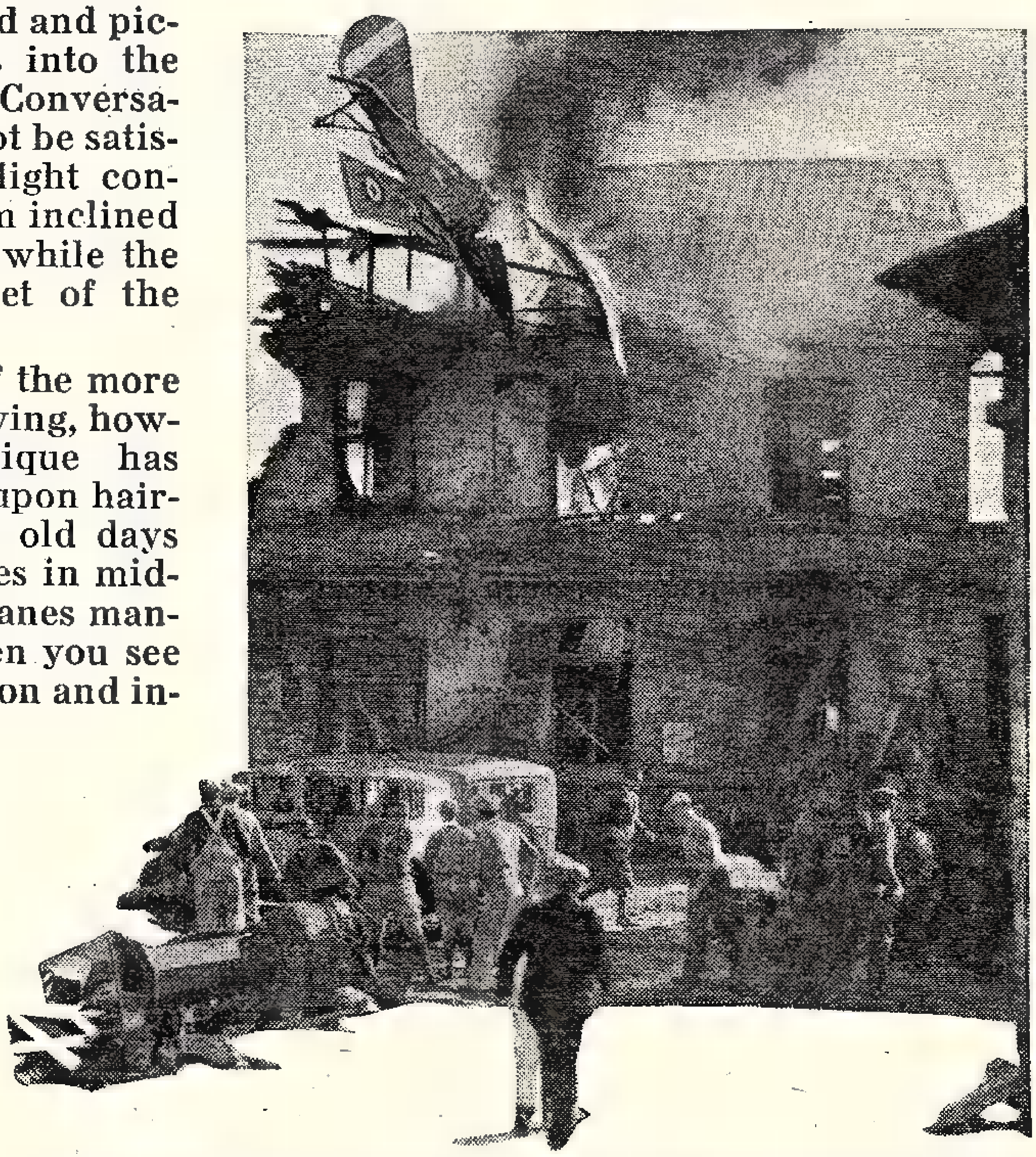
slight directional error crashed the plane on a rooftop instead of in the street below.

In these days of improved sound and picture technique, head-on crashes into the ground are seldom attempted. Conversation and closeups obviously cannot be satisfactorily recorded under such flight conditions. Dummy planes drop from inclined runways to provide the crashes while the closeups are filmed in the quiet of the barn-like sound stages.

Despite the removal of some of the more obvious dangers of movie stunt flying, however, improved picture technique has placed an even greater premium upon hairline precision in the air. In the old days some of the daring fight sequences in midair were enacted by miniature planes manipulated by wires; but today when you see several planes looping in formation and indulging in various aerobatics you may rest assured that daring pilots actually went aloft and performed the thrilling maneuvers in person.

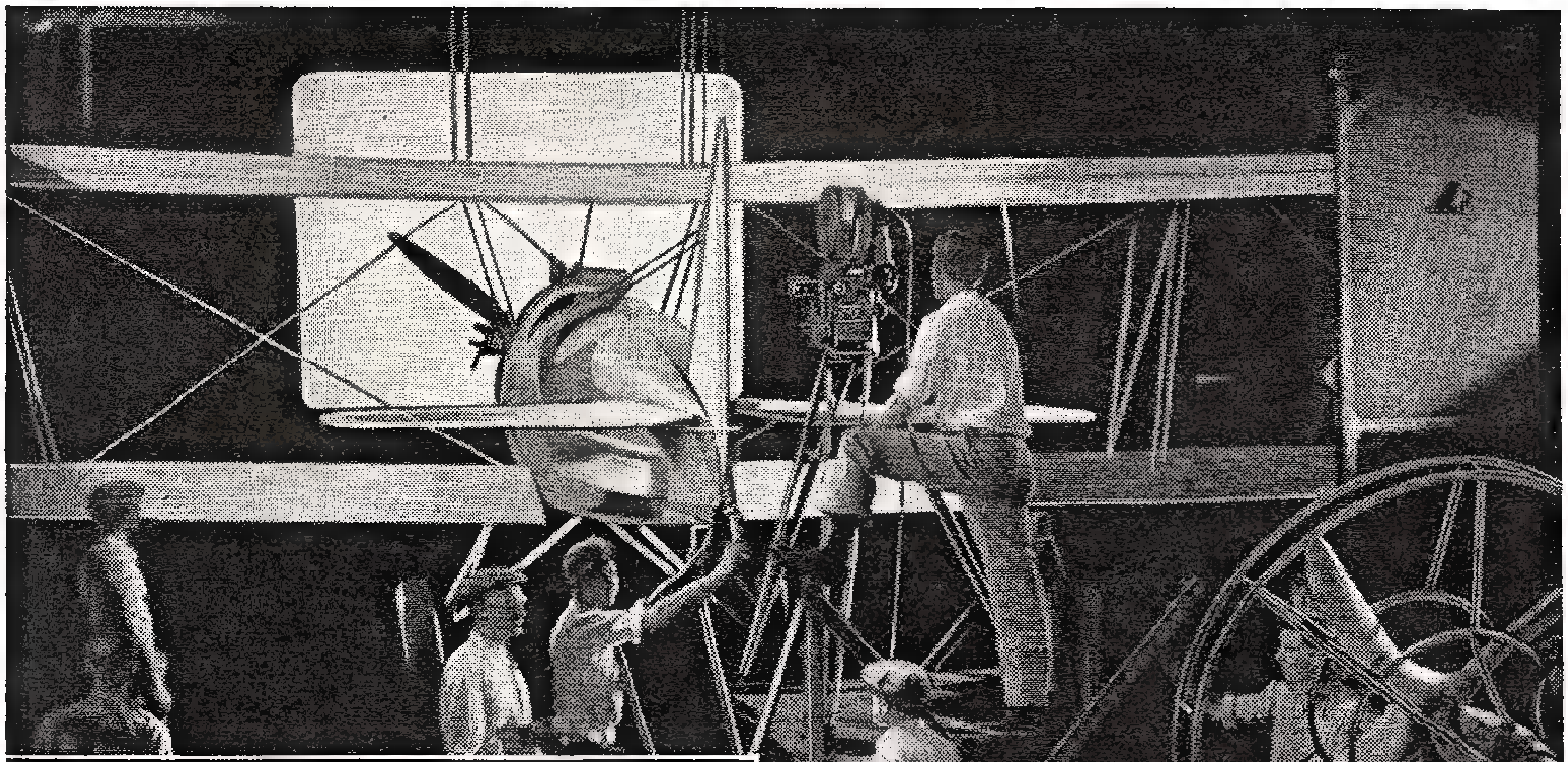
The customary procedure prior to the filming of a dog fight sequence is to plot the action in a chalk-talk session reminiscent of the football field. "This," explains the chief pilot, drawing scrawls on the blackboard, "will be the dog fight action.

"I'm going to give Jack the slow plane. Earl takes the red ship and follows Jack. I'll fly the gray plane and force Earl out from all angles. Let's make it short and snappy—like a series of real crashes in the air."

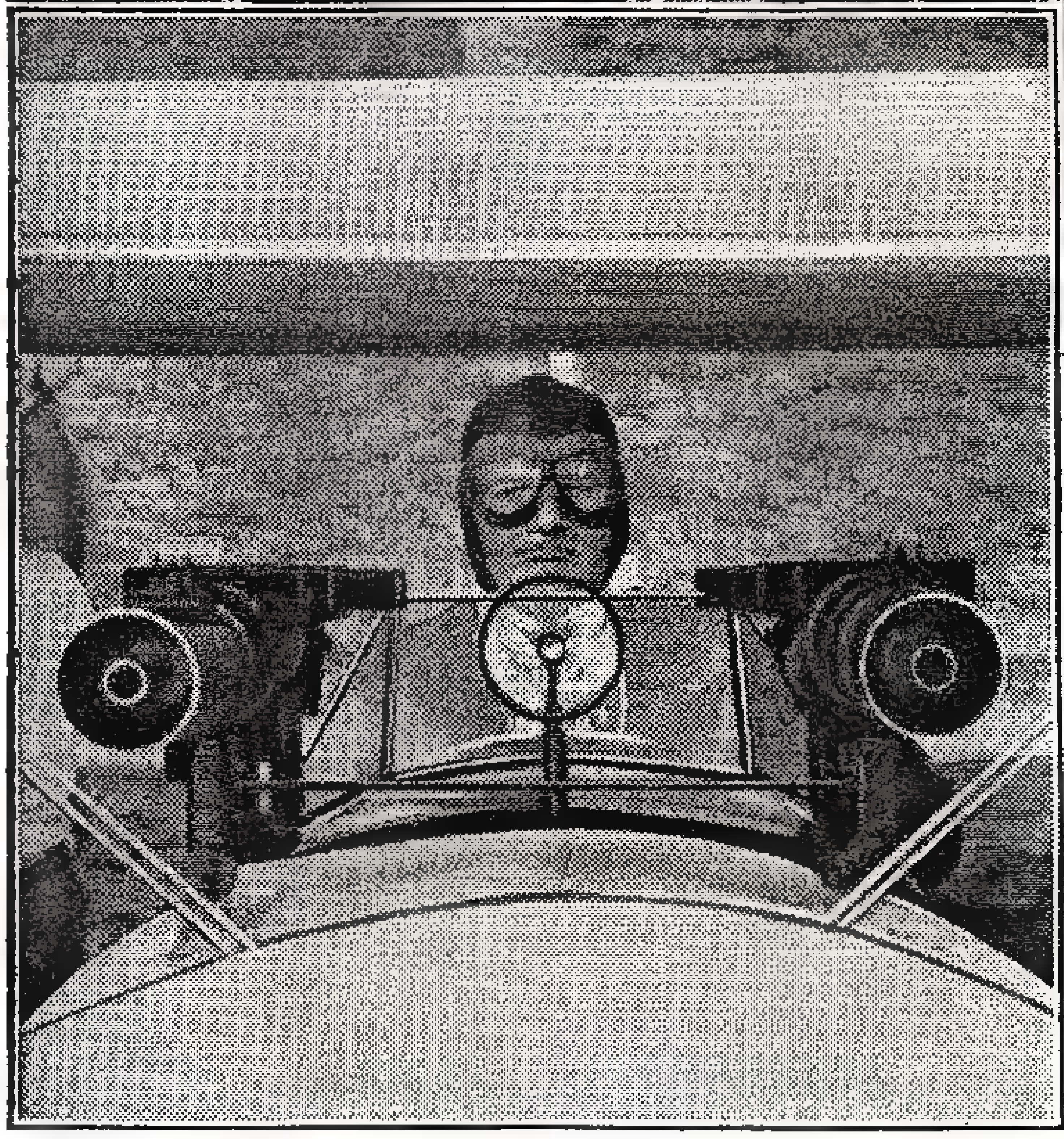


Launched from the catapult at left, this plane crashed spectacularly in "The Lost Squadron" without endangering life. The only miscarriage in plans came through a slight directional error when the plane crashed on the roof instead of in the street, before the cameras, as intended by the director.

Star Closeups Are Filmed Against Background of Synchronized Air Shots



The impossibility of filming sound pictures under actual flight conditions prompted invention of the device shown above. Mounted behind the stationary plane, the camera is pointed toward a ground glass screen onto which are projected the synchronizing "shots" previously filmed aloft.



Although some of the cinema stars are licensed pilots, most closeups are filmed on the ground. Experienced men perform the actual, hazardous maneuvers in the air.

Ten minutes later Garland Lincoln, Jack Rand and Earl Gordon—who furnished the thrills for "Air Circus"—are riding each other's tails around the sky a scant 500 feet above the ground. Each time Jack is set for a getaway, Earl (doubling for the villain) comes roaring close behind him in an effort to crash into his tail assembly. Then Lincoln dashes in, seemingly from nowhere, now passing scant inches from Earl's ship, now zooming up between the two planes in split-second maneuvers. All of this, mind you, is taking place on an aerial stage directly in front of the cameras. The planes seldom change altitude more than 500 feet and confine themselves to an invisible boundary of 1000 feet.

Dog fights such as this in which Death rides the cockpit may occupy only thirty feet of film in the finished picture; yet they are among the most difficult scenes filmed for the talkies. Not only must the flyers avoid collision while actually passing each other at right angles to the camera, but they must appear to meet head-on to provide the thrills called for in the script. In addition, they must remain high enough to keep ground scenes out of the picture, keep within distance range of the lenses and confine their flying to a circumscribed area in order that the cameras need not be "panned," or moved horizontally.

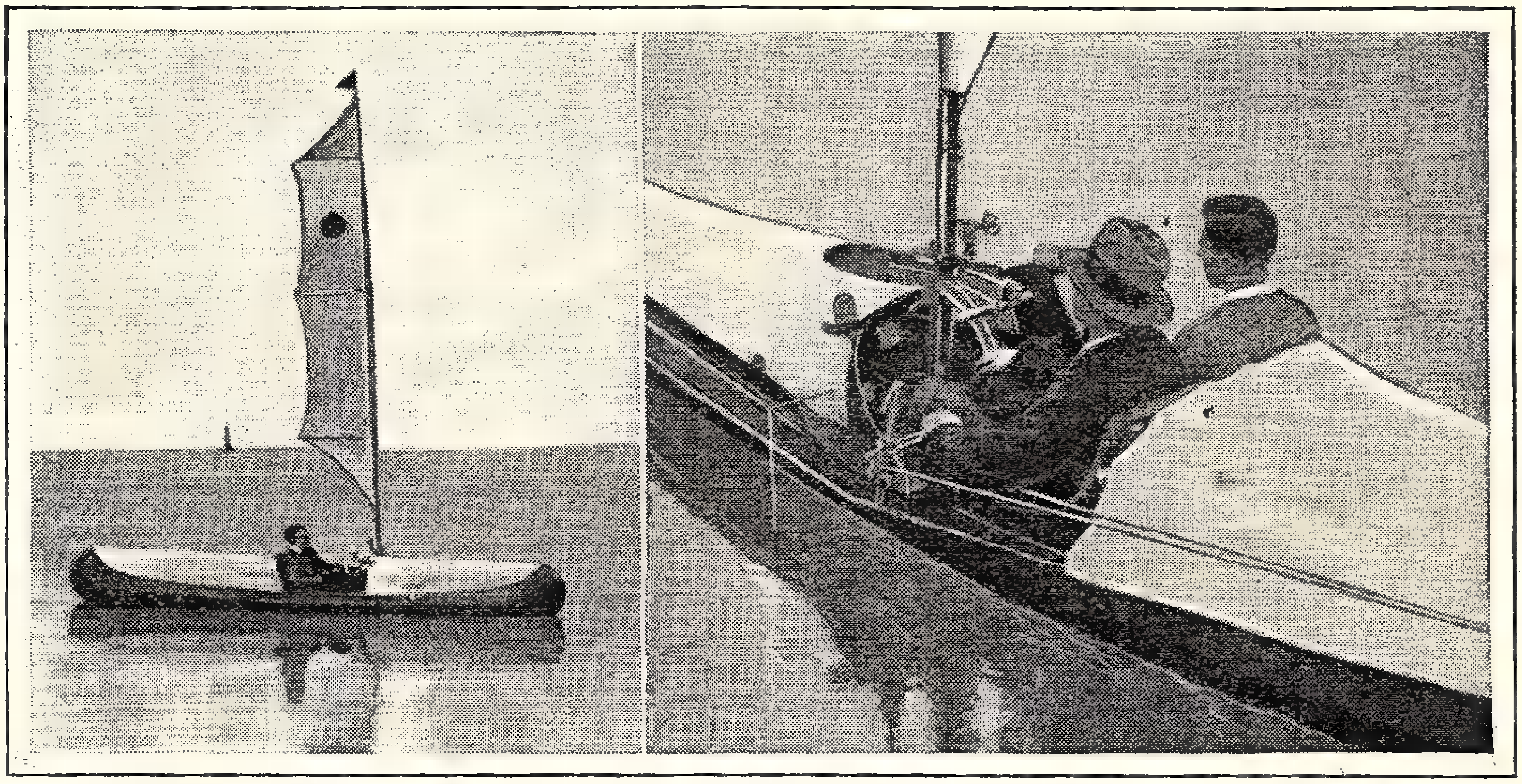
Flyers Stunt Without Air Rehearsals

And the entire job is done without a rehearsal! Other than the memory of a hastily plotted blackboard talk, the movie flyer goes up on a moment's notice to gamble his life on his hair-line judgment in the air. How, then, are these miraculous stunts performed—and how does the movie cameraman photograph them?

The secret of successful cinema flying lies in finding three or more pilots who are easily teamed, who fly automatically with a certain psychic sense of what the other fellow is going to do.

(Continued on page 142)

Flapping "Air Oar" Propels Sailboat in Wind or Calm

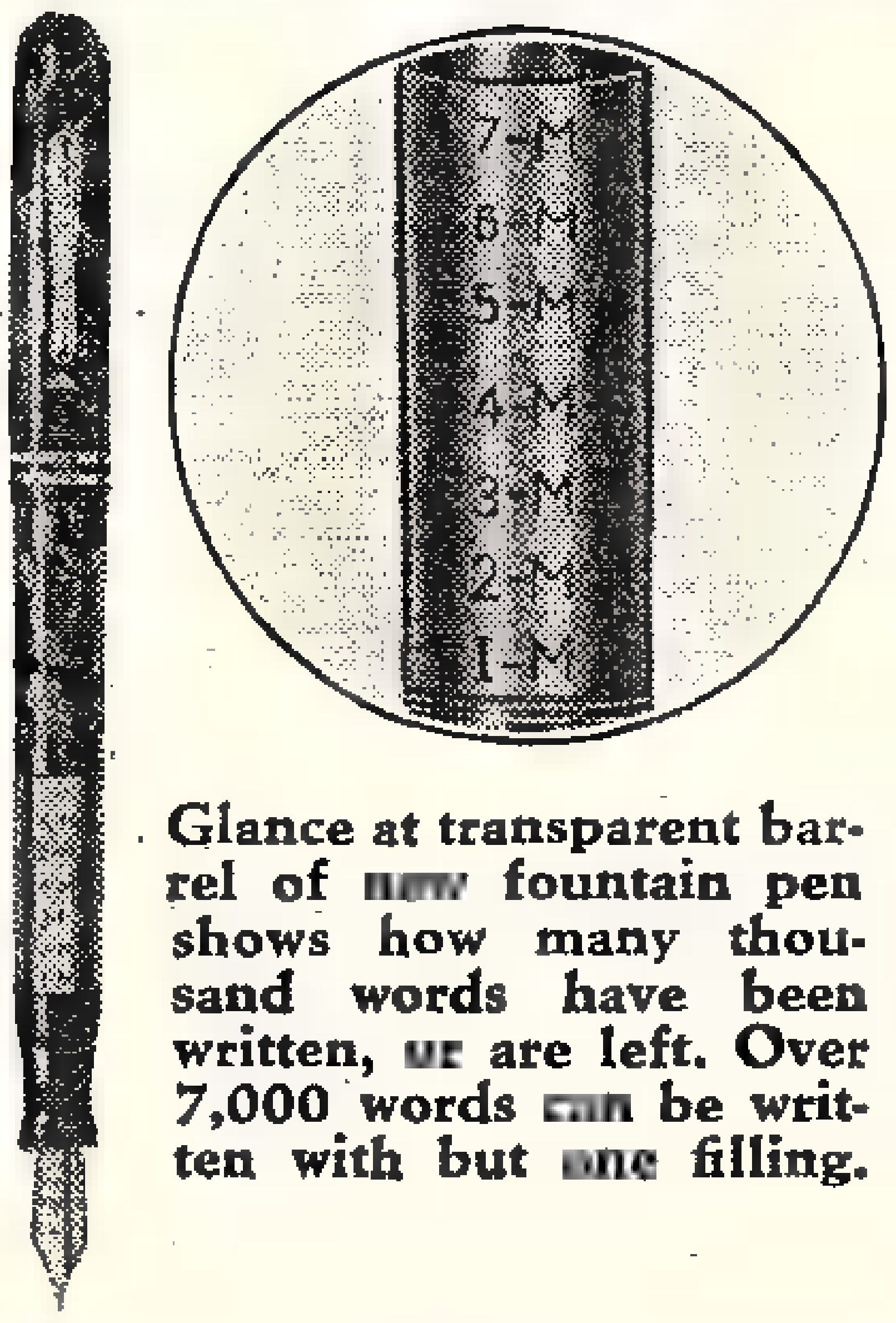


New "air oar," when held rigid, acts as sail. In calm weather mast can be rocked back and forth as in rowing, to move sailboat. At right is shown mechanism for rocking mast, steering boat, keeping sail in wind. Speed indicator drags in water.

THE "air oar," most revolutionary sailboat rig ever devised, has been introduced by a class of aeronautical students at Detroit. The sail is practically an aeroplane wing on end, pivoted to the boat so that it can be turned with the wind, or rocked back and forth just as in rowing. The fabric covering is loosely applied, so that it can take the shape providing the best aerodynamic curve.

Experiments made with a canoe in various kinds of weather prove the seaworthiness of the new sail rig. The "oar" here serves as a means for propelling and steering the boat in heavy or light winds.

New Pen Counts Words Written



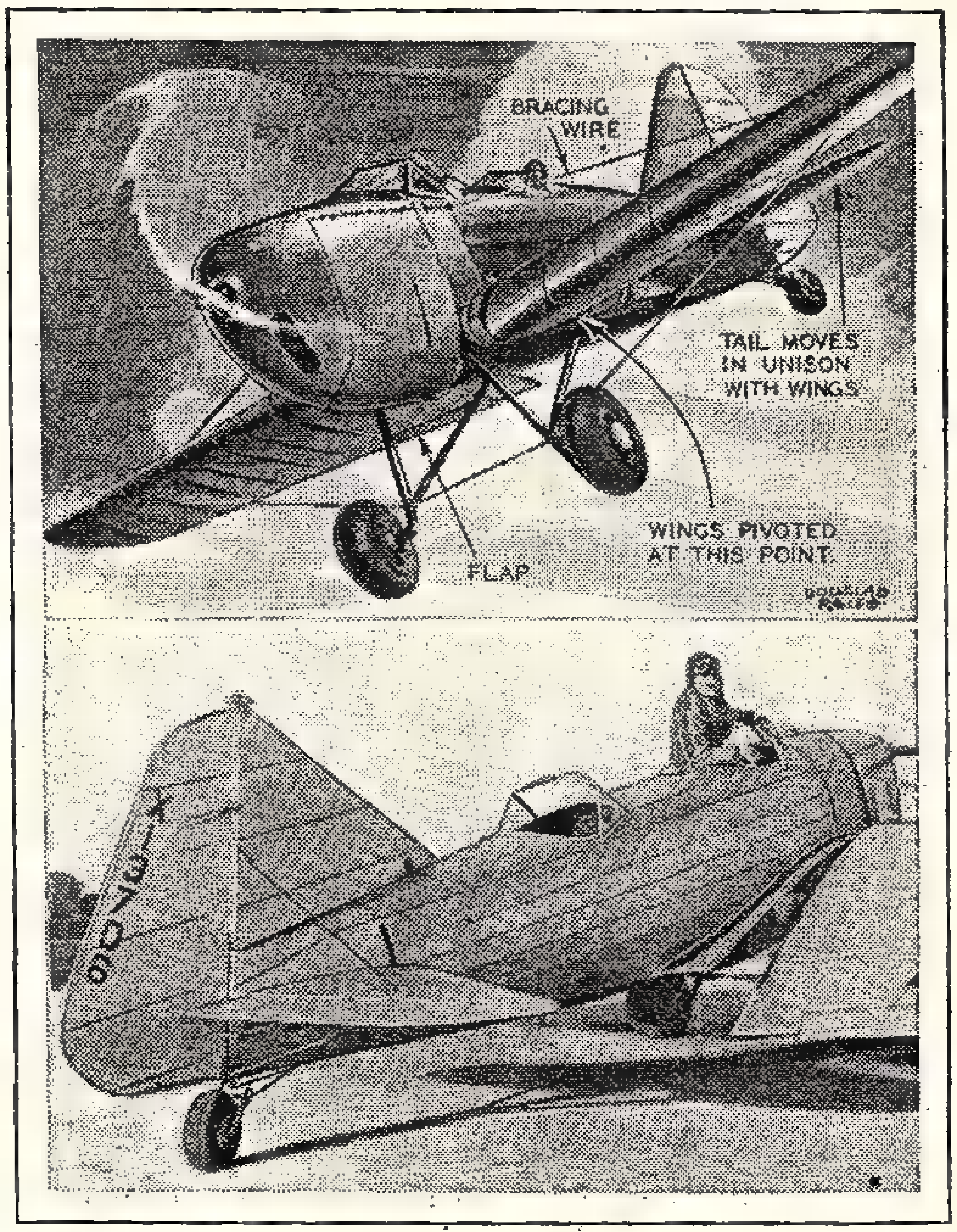
Glance at transparent barrel of new fountain pen shows how many thousand words have been written, or are left. Over 7,000 words can be written with but one filling.

NO LONGER need authors count words to determine how much they have written — a recently developed sackless fountain pen now does the work.

On the transparent ink section of the barrel are graduations indicating in thousands the words written since the pen was filled, and the remaining writing capacity. Seven thousand words can be written with one filling. Pen was calibrated by actual count of words.

Plane's Wings Pivoted at Center

A "FOOL PROOF" monoplane using pivoted wings at last combines low landing speed with super-maneuverability and high cruising speed. Wings are adjustable from the cockpit for different speeds. In first tests a top speed of 147 m.p.h. was combined with a landing speed of but 10 m.p.h.


BRACING WIRE
TAIL MOVES IN UNISON WITH WINGS
WINGS PIVOTED AT THIS POINT
FLAP

Wings of the new monoplane are pivoted at center of lift, and are controlled from the cockpit. The wings may be set to act as air brakes, giving a landing speed of 10 m.p.h. G. W. Cornelius, the designer, is shown below.

Stabilizer Stops Auto From Crashing After a Blowout

Piston and cylinder device which attaches to steering gear and frame of any car eliminates hazards of blowouts at high speed. Piston does not affect normal driving of the auto.

AN AUTOMOBILE stabilizer which eliminates entirely the hazard of tire blowouts at high speeds is now being marketed by a Los Angeles manufacturer. The device consists of a special piston attached to the axle and moving freely in a fluid-filled cylinder. Under emergency conditions the piston holds the wheels rigid.

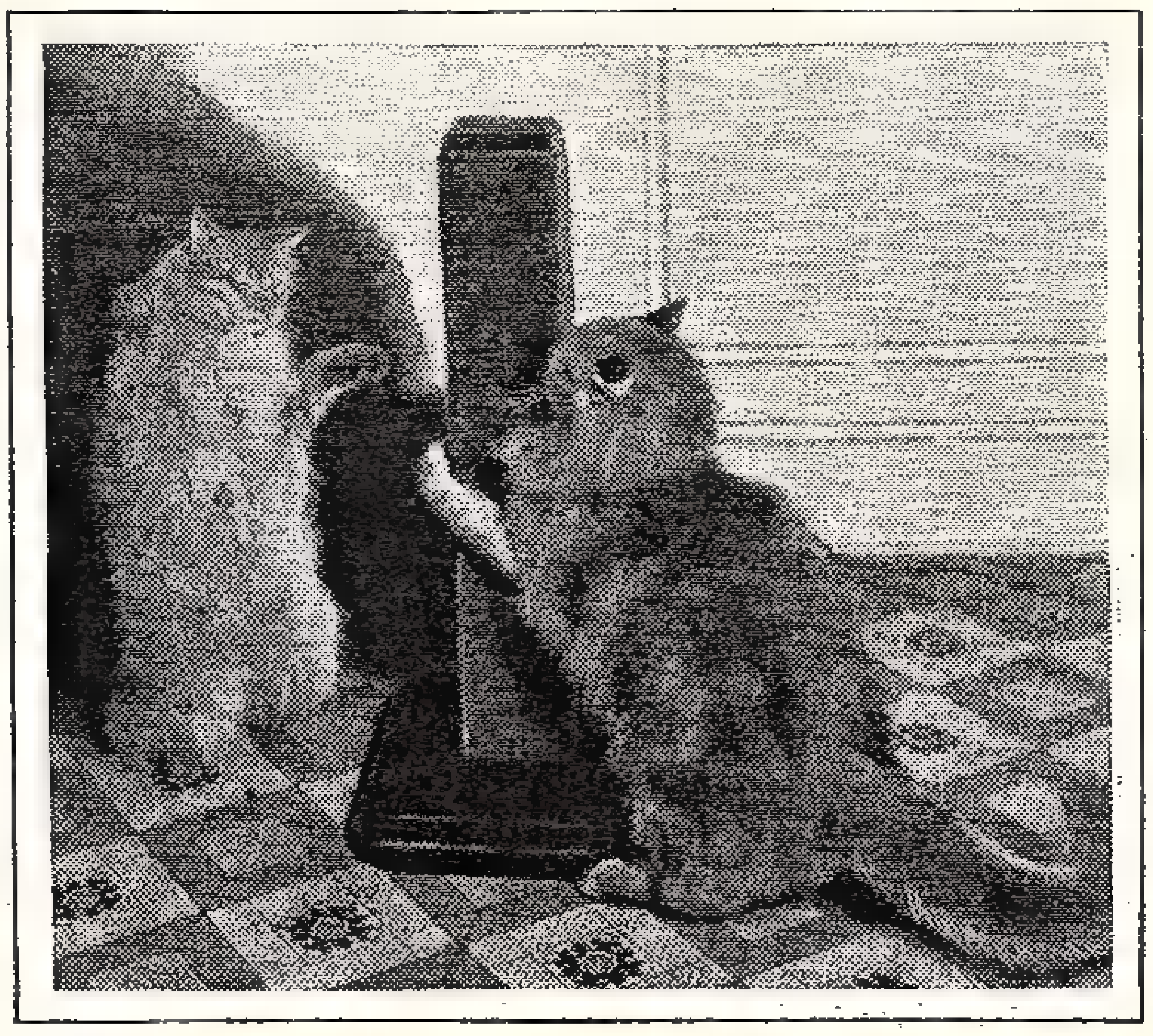
In a recent test the right front tire of an automobile traveling at 60 m.p.h. was blown out with a shotgun and the car did not deviate from its course.

Tides Used to Move Boston Bridge

WHEN the 1,200,000-lb. draw of the Fore River bridge near Boston had to be moved 400 feet upstream to a new position, engineers let the tide do most of the work. At low tide scows were placed beneath the heavy steel structure. Then, as the ocean tide rose high in the river, the draw was lifted clear of its supports. It then was floated to its new location and lowered into position as the river water level dropped again with ebb tide.

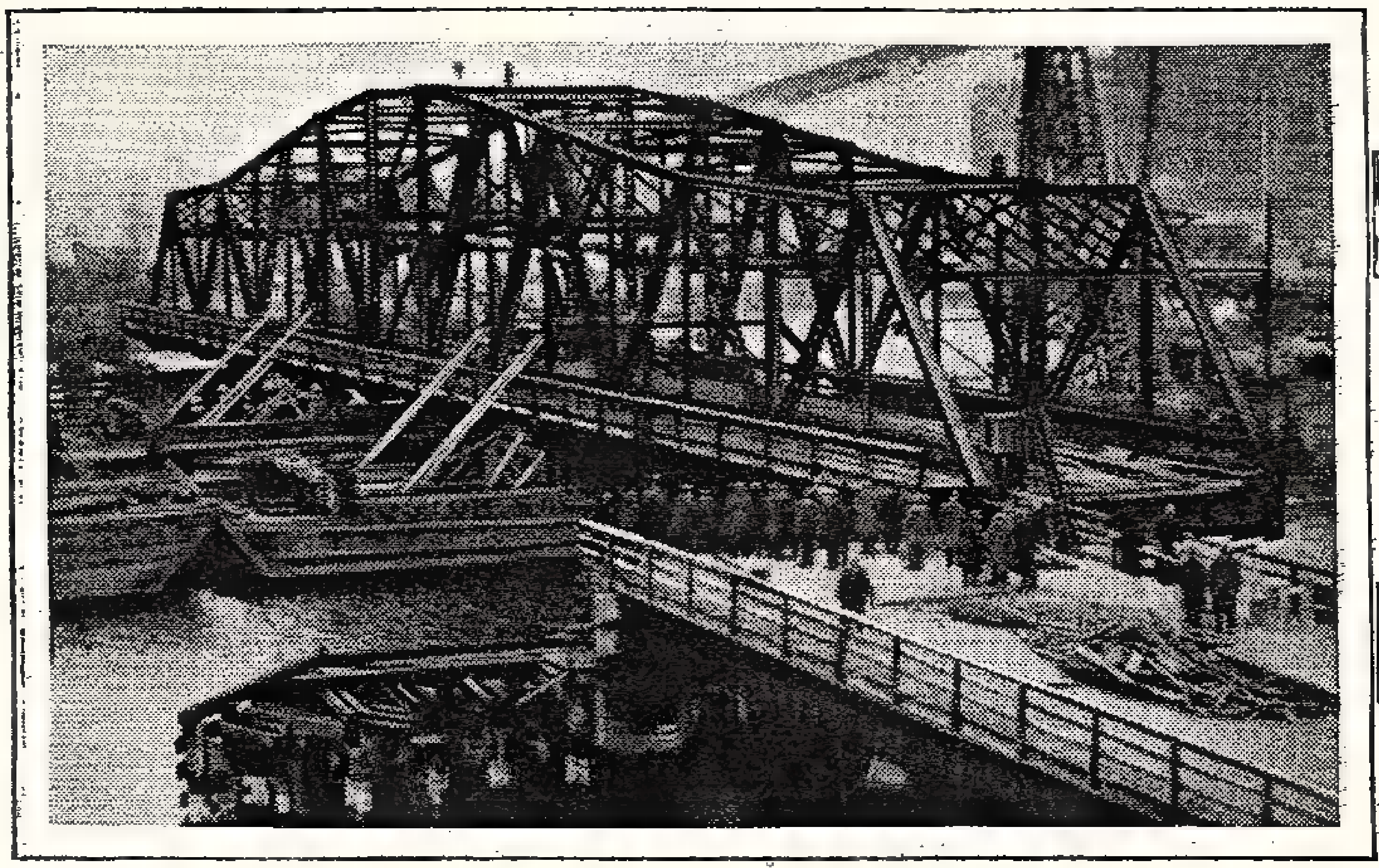
Powerful tugboats towed the million pound structure to its new location and maneuvered it into position. A few bolts were inserted, and the bridge was ready for use, none the worse for its voyage.

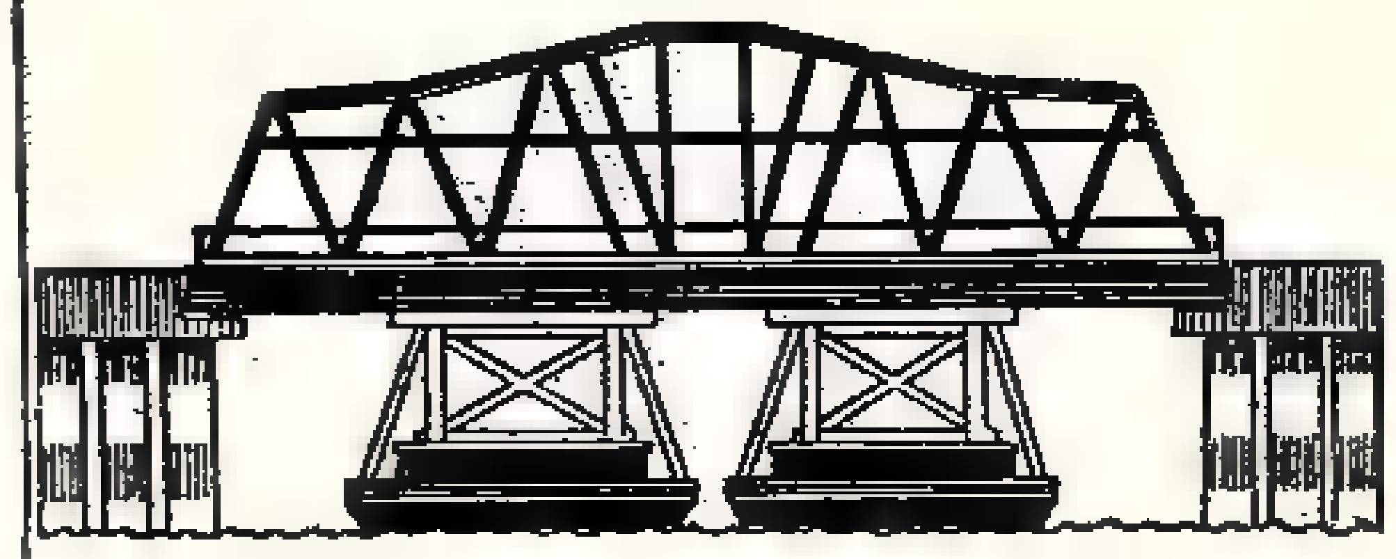
Kittens Frolic About Catnip Block



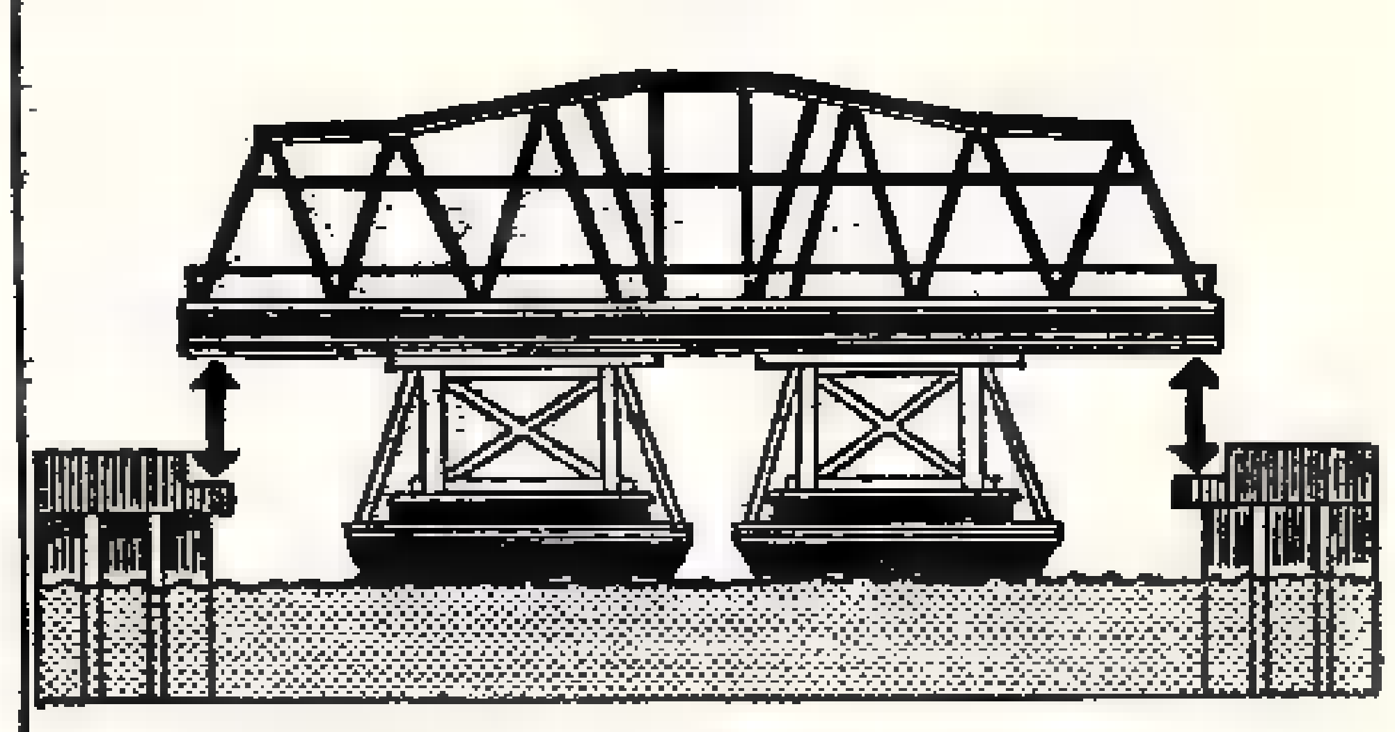
Just a two foot high wooden post covered with soft carpet, but how cats do love it! The secret—it's filled with catnip.

CATS find great pleasure in rubbing their paws on a new ornamental post filled with catnip. The novel decoration is covered with soft carpet for greater feline comfort, and attractively finished to match the home furnishings.





BRIDGE LOWERED IN PLACE AT LOW TIDE



BARGES RAISE BRIDGE AT HIGH TIDE

At low water high scows were slipped under this 1,200,000 pound drawbridge on the Fore River near Boston. As the tide came in, the bridge was lifted from its supports, and then towed to a new location. Sketches at right show method.

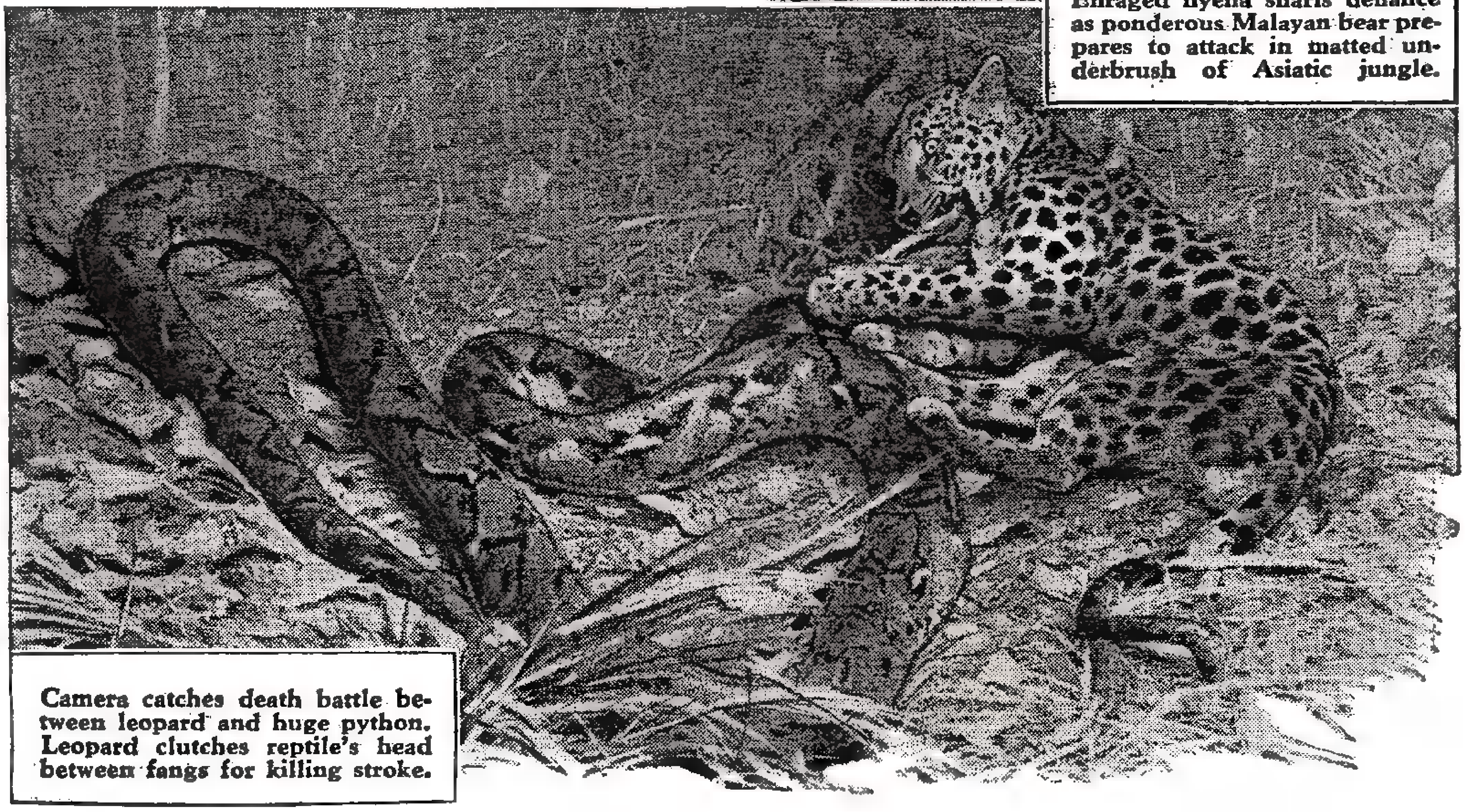
Movie Expedition Films Fierce Death Battles in Jungles

Startled by sudden glare of flashlight, this ferocious tiger glares balefully at the camera. Photo made by expedition filming "Devil-Tiger" in Siam, India, and Malaya jungles.

THOUSANDS of feet of movie film recording some of the most ferocious of jungle animals engaged in battles to the death were brought back recently. The expedition spent a year in the tangled jungles of India, Siam, Indo-China, and Malaya.

These jungle warfare scenes will be used in the new animal-adventure picture "Devil-Tiger." Shots such as these show clearly how "survival of the fittest" applies to jungle beasts and reptiles.

Enraged hyena snarls defiance as ponderous Malayan bear prepares to attack in matted underbrush of Asiatic jungle.

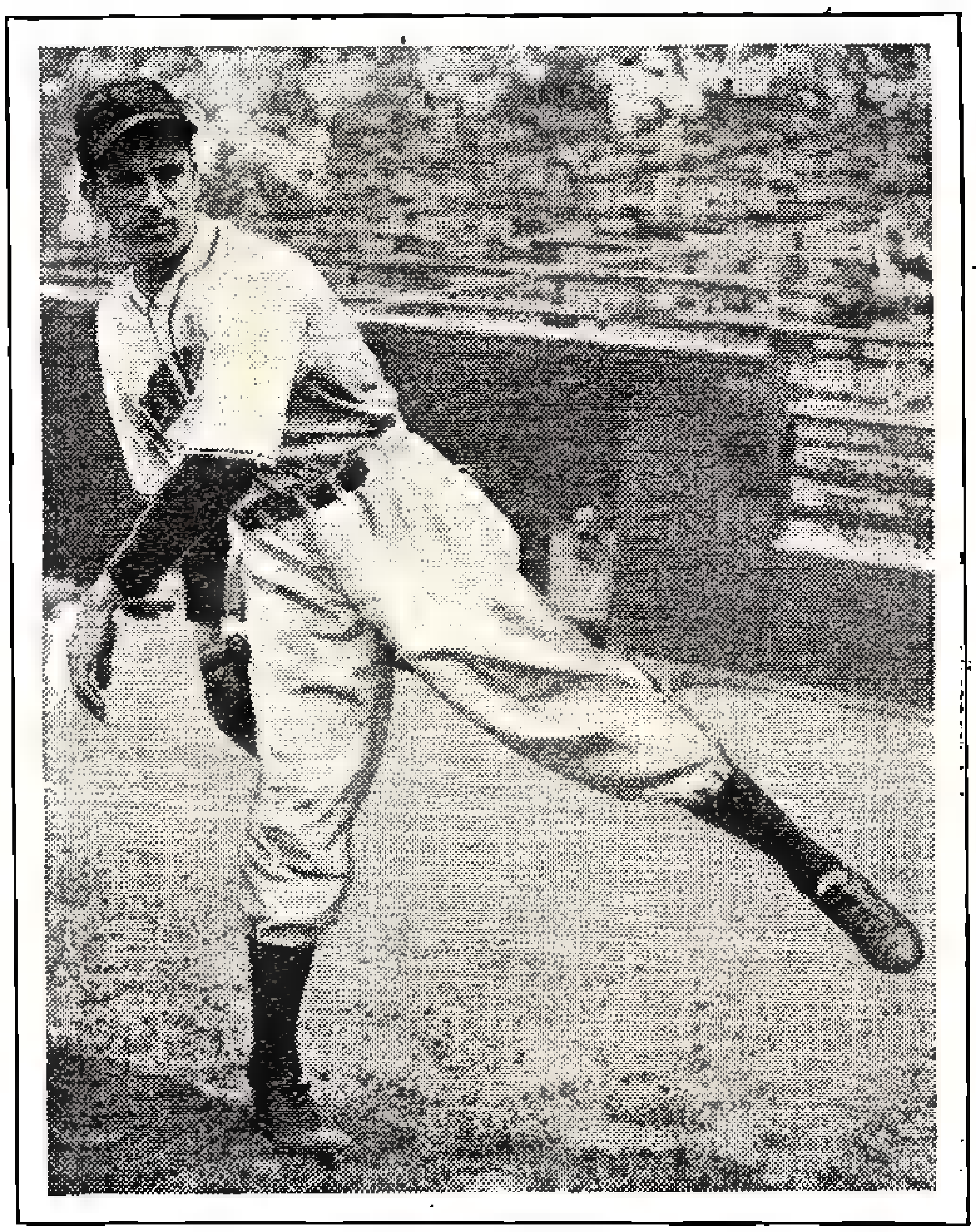


Camera catches death battle between leopard and huge python. Leopard clutches reptile's head between fangs for killing stroke.

Learn to Play BASEBALL

Baseball is not just throwing and hitting a ball. Here stars tell you how a turn of the wrist or the grip on a bat put them into limelight on major league diamonds.

by JOHN C. HOFFMAN



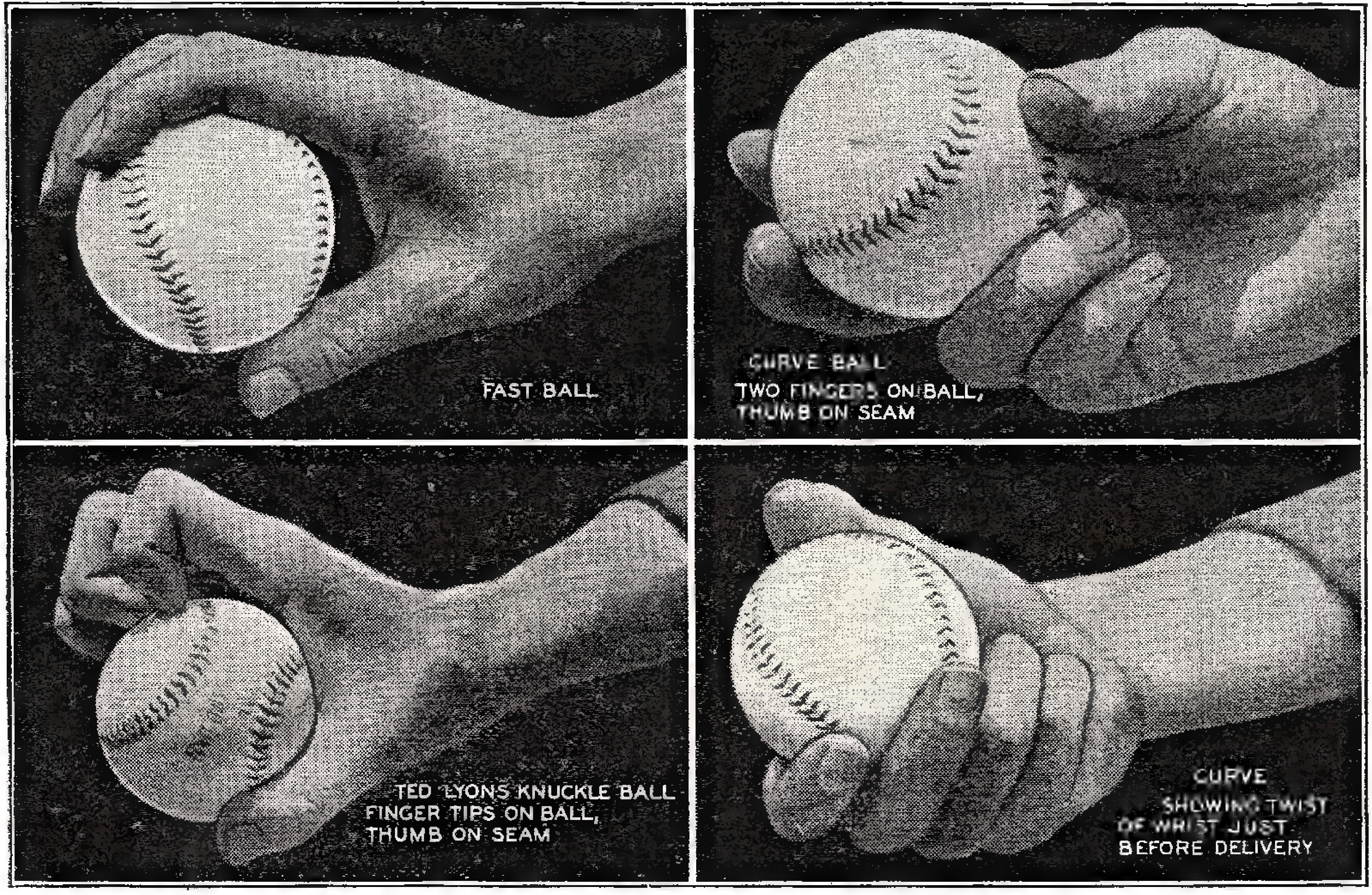
Carl Hubbell, 1933 series hero, pitching for the Giants.

STARS like Babe Ruth, Carl Hubbell, Al Simmons, and Ted Lyons did not walk into the baseball limelight through luck alone. They learned baseball by studying the stars of bygone days. If you want to be a good batter or a good pitcher, let the men at the top of the baseball ladder teach you.

Baseball might be called a sport in which mechanics is important. We might talk about leverage, fulcrum, power, air resistance, and speed, but without getting too technical, let us put the spotlight on the pitcher's grip on a ball, the batter's grip on his bat or his stance at the plate. Let's see what makes them go, so to speak. Let's see how they hit, throw curved balls, knuckle balls, screw balls and whatnot.

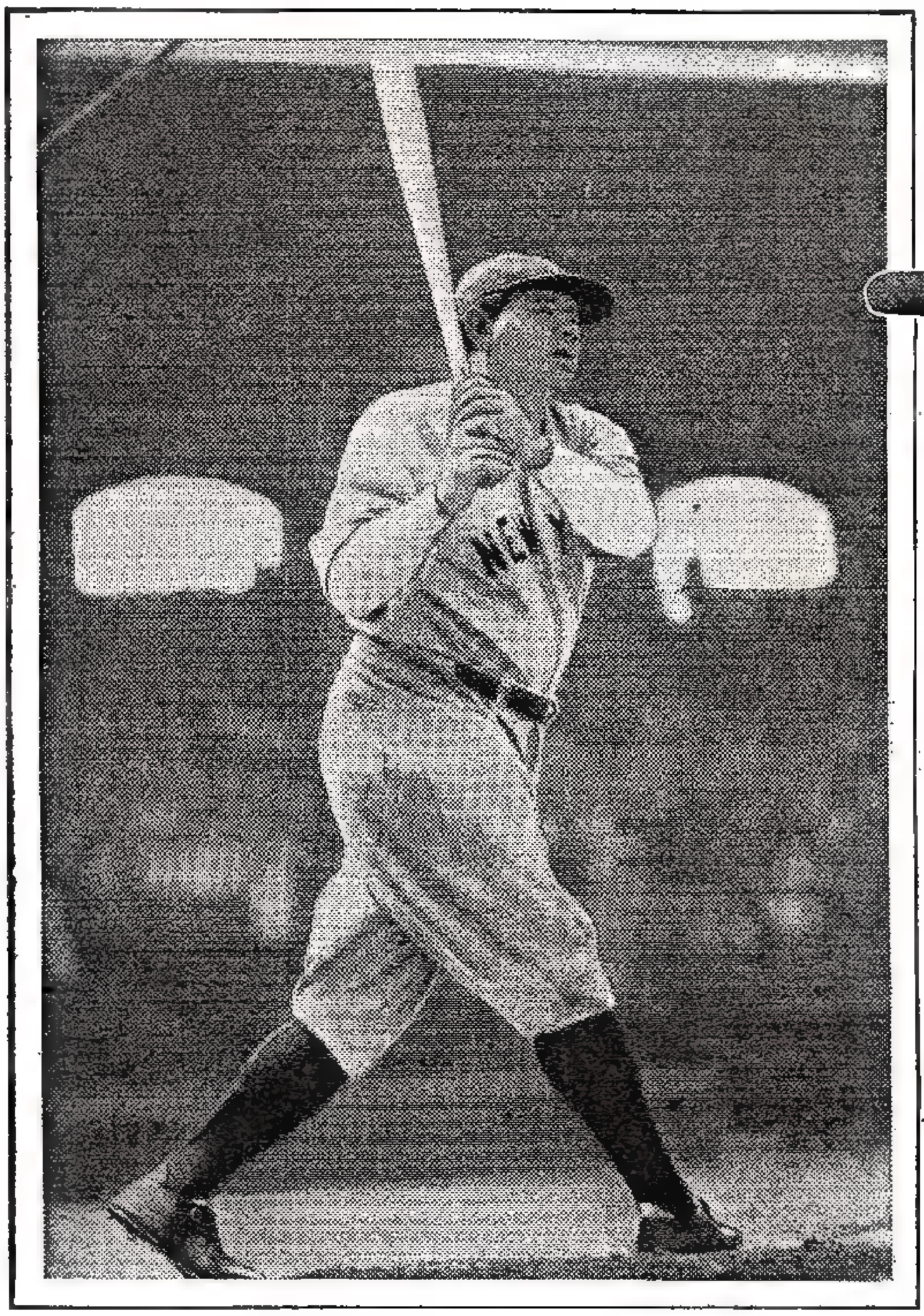
We'll take some of the better known pitchers first. Probably the five most popularly accepted deliveries are the curve ball, the knuckle ball, the fast ball, the slow and the screw ball. Some of the others are the fadeaway, the cross-fire, the fork ball and the downer.

The possession of any or all of these

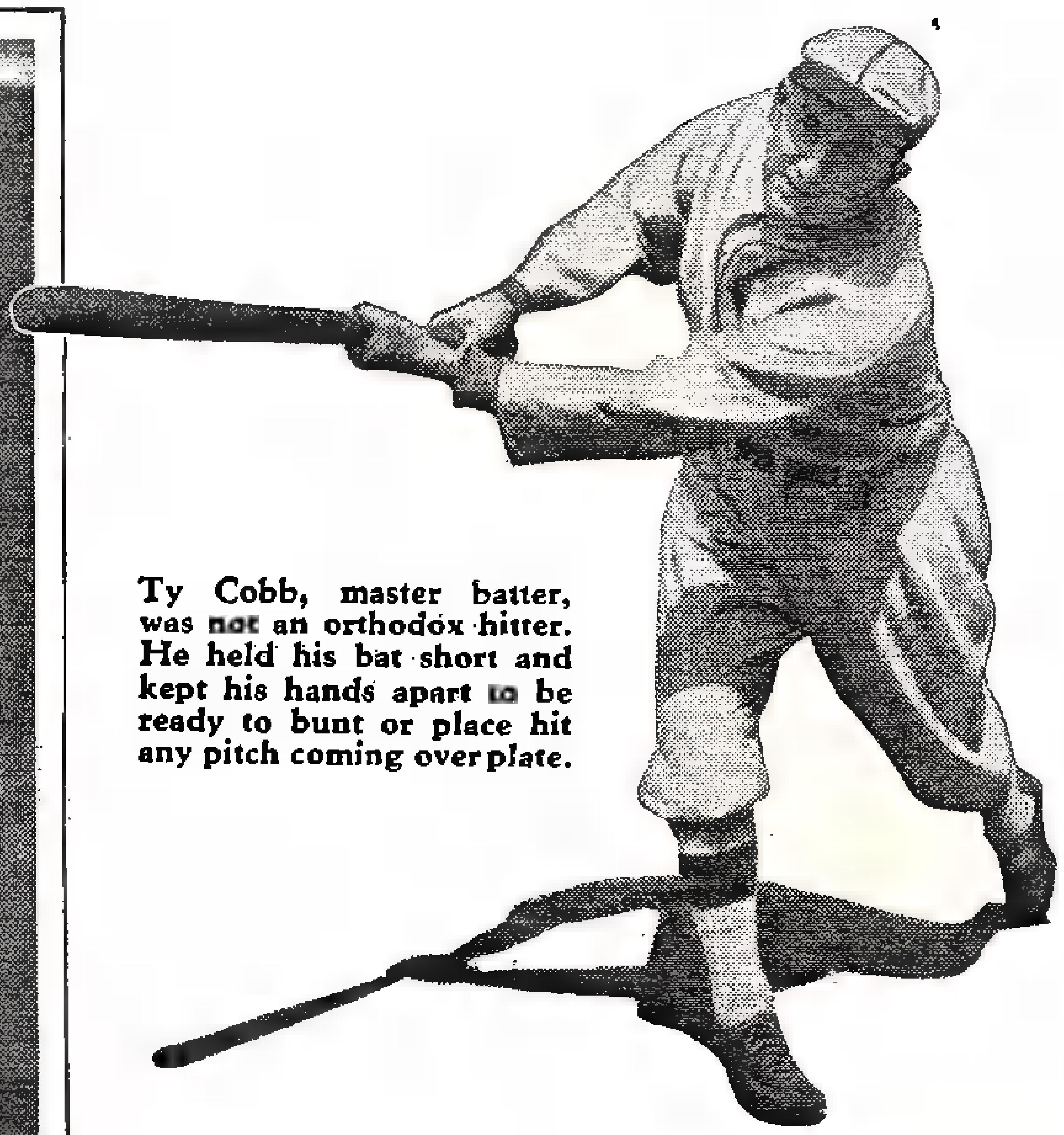

FAST BALL
CURVE BALL
TWO FINGERS ON BALL,
THUMB ON SEAM
TED LYONS KNUCKLE BALL
FINGER TIPS ON BALL,
THUMB ON SEAM
CURVE
SHOWING TWIST
OF WRIST JUST
BEFORE DELIVERY

Pitchers' grips for some of the most popular forms of deliveries are illustrated here by Ted Lyons, White Sox ace.

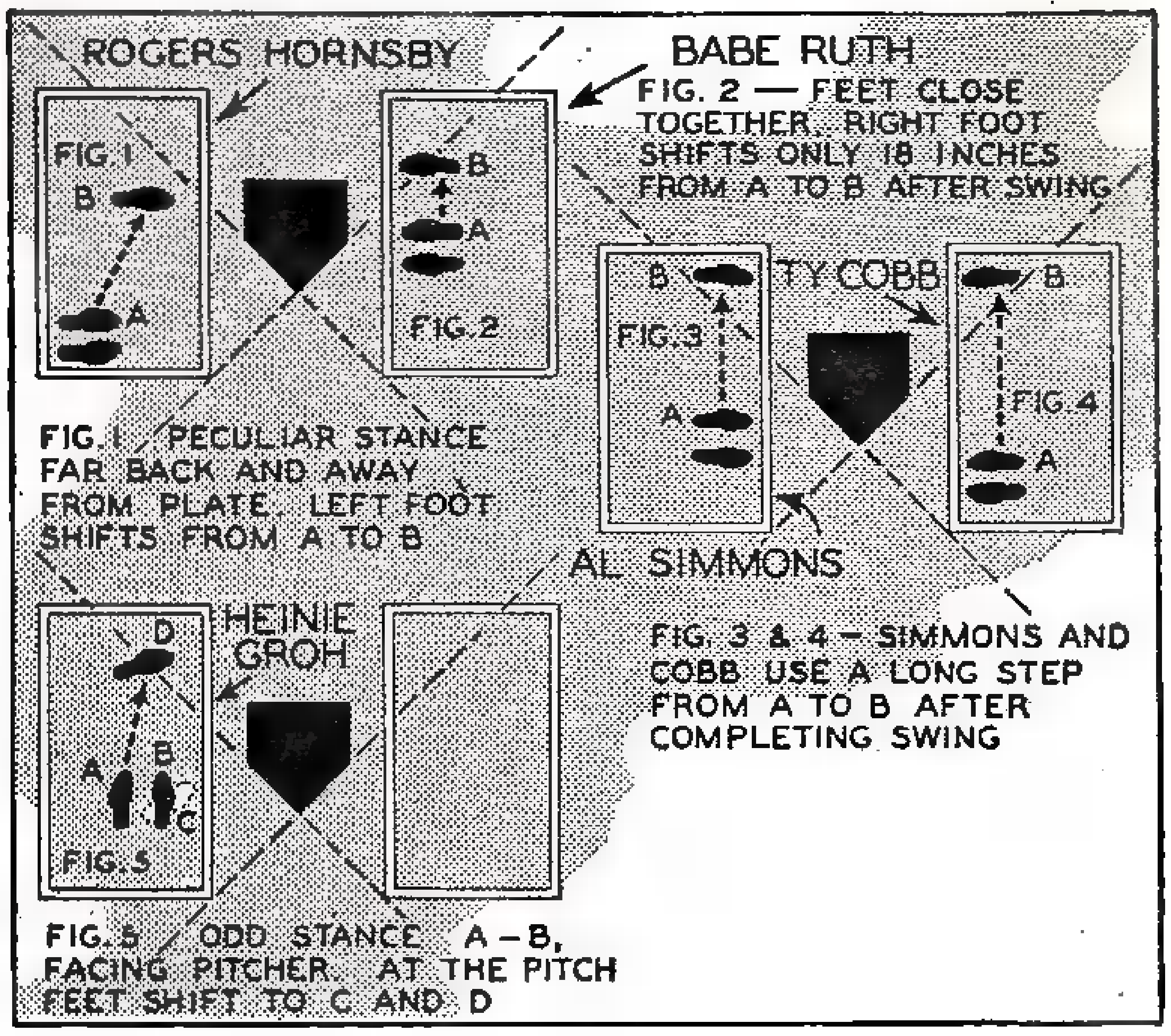
from BIG LEAGUE Stars



Babe Ruth, baseball's great slugger, holds his bat long.



Ty Cobb, master batter, was not an orthodox hitter. He held his bat short and kept his hands apart to be ready to bunt or place hit any pitch coming over plate.



ROGERS HORNSBY
BABE RUTH
FIG. 2 — FEET CLOSE TOGETHER. RIGHT FOOT SHIFTS ONLY 18 INCHES FROM A TO B AFTER SWING
FIG. 1
B
A
B
A
FIG. 2
B
FIG. 3
A
TY COBB
B
FIG. 4
A
FIG. 1 PECULIAR STANCE FAR BACK AND AWAY FROM PLATE. LEFT FOOT SHIFTS FROM A TO B
AL SIMMONS
D
HEINIE GROH
A
B
C
FIG. 5
FIG. 3 & 4 — SIMMONS AND COBB USE A LONG STEP FROM A TO B AFTER COMPLETING SWING
FIG. 5 ODD STANCE A-B, FACING PITCHER. AT THE PITCH FEET SHIFT TO C AND D

Various stances at the plate used by great hitters are shown above. Hornsby's and Groh's are most unorthodox.

deliveries, however, does not make a great pitcher. A winning pitcher must, of course, have a change of pace, a deceptive delivery, intelligence, courage and last, but most important, control.

The curve ball is most common and comes in a hundred varieties. Most of them are thrown by placing the first two fingers on the smooth surface of the ball and thumb on the seam. This has a tendency to slightly retard the progress of one side of the ball while the side under the first two fingers is sliding, thus affecting a spin and the consequent curve.

Throwing the Knuckle Ball

The slow ball is generally gripped by all five fingers. At the instant of its delivery all five fingers are opened simultaneously so as not to put a spin on the ball. Approaching the batter, the ball thus appears larger and has a tendency to throw the hitter off his stride.

The knuckle ball is a widely used delivery, but difficult to control. In the majority of cases the ball is held with the thumb and the little finger against the ball and the other three fingers crooked, with the first joints resting against the surface.

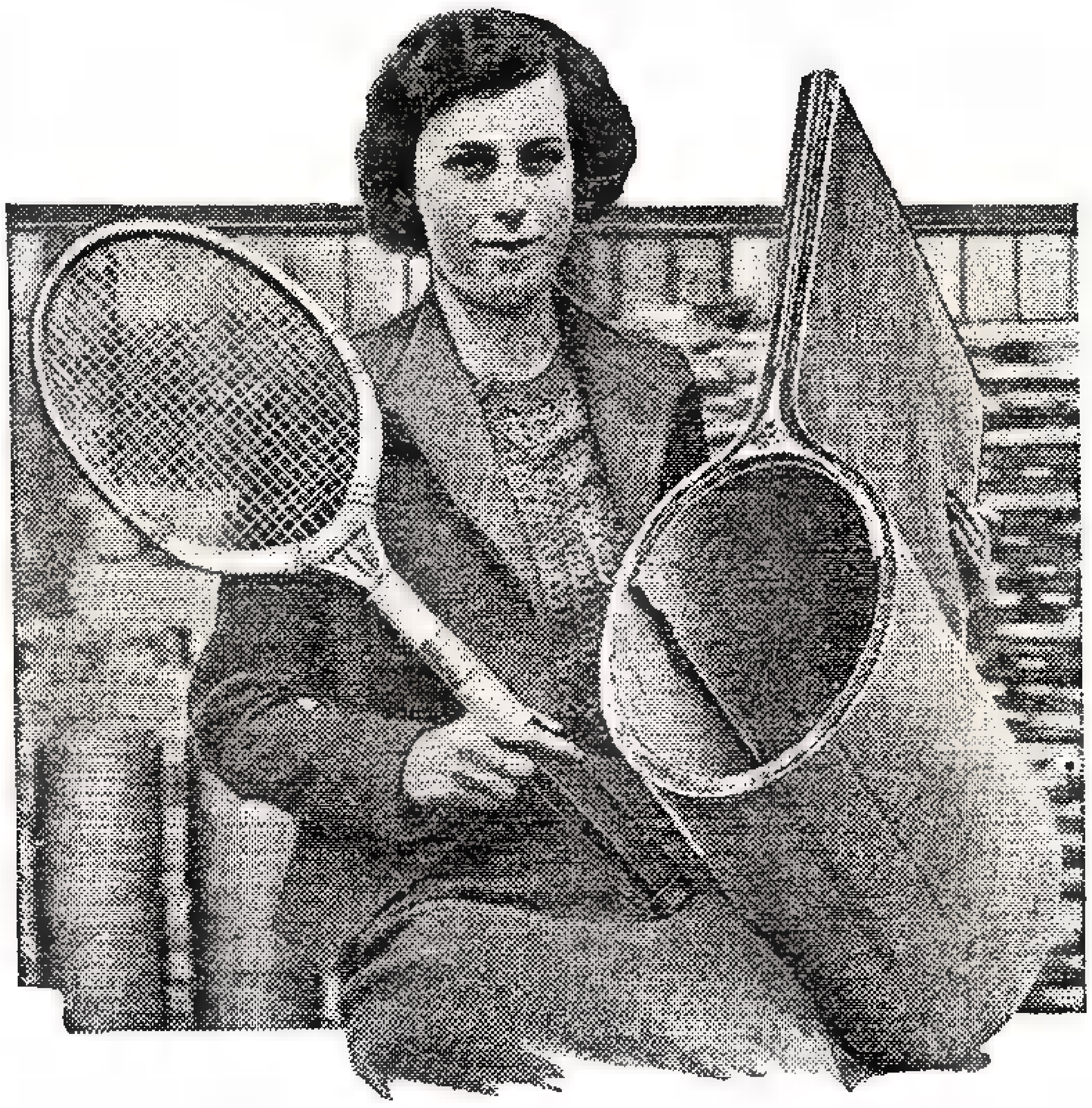
A notable exception to the custom, however, is Ted Lyons, Chicago White Sox ace, who places the tips of four fingernails on the leather with the thumb pressed on the ball as in the case of the curve ball delivery.

This would seem to make it more difficult than ever to control the ball, but not so with Lyons. Explaining his knuckle ball, he says:

"I find that I can get more of a break on the ball by gripping it with four fingernails. It took years to develop this delivery. I first experimented with the knuckle ball while still at Baylor University. I had

(Continued on page 135)

Tennis Racquets Sliced From Glued Sheets of Plywood



By first building up plywood and veneer forms like that shown above, a London factory is slicing out over 3,000 tennis racquets a week. Finished racquet is also shown.

A LONDON, England, factory is using an entirely new production method to turn out over 3,000 tennis racquets a week. Huge sheets of plywood and veneer are curved to shape around solid forms and glued together. A complete racquet frame is sliced out each time the queer plywood form is pushed across the saw table.

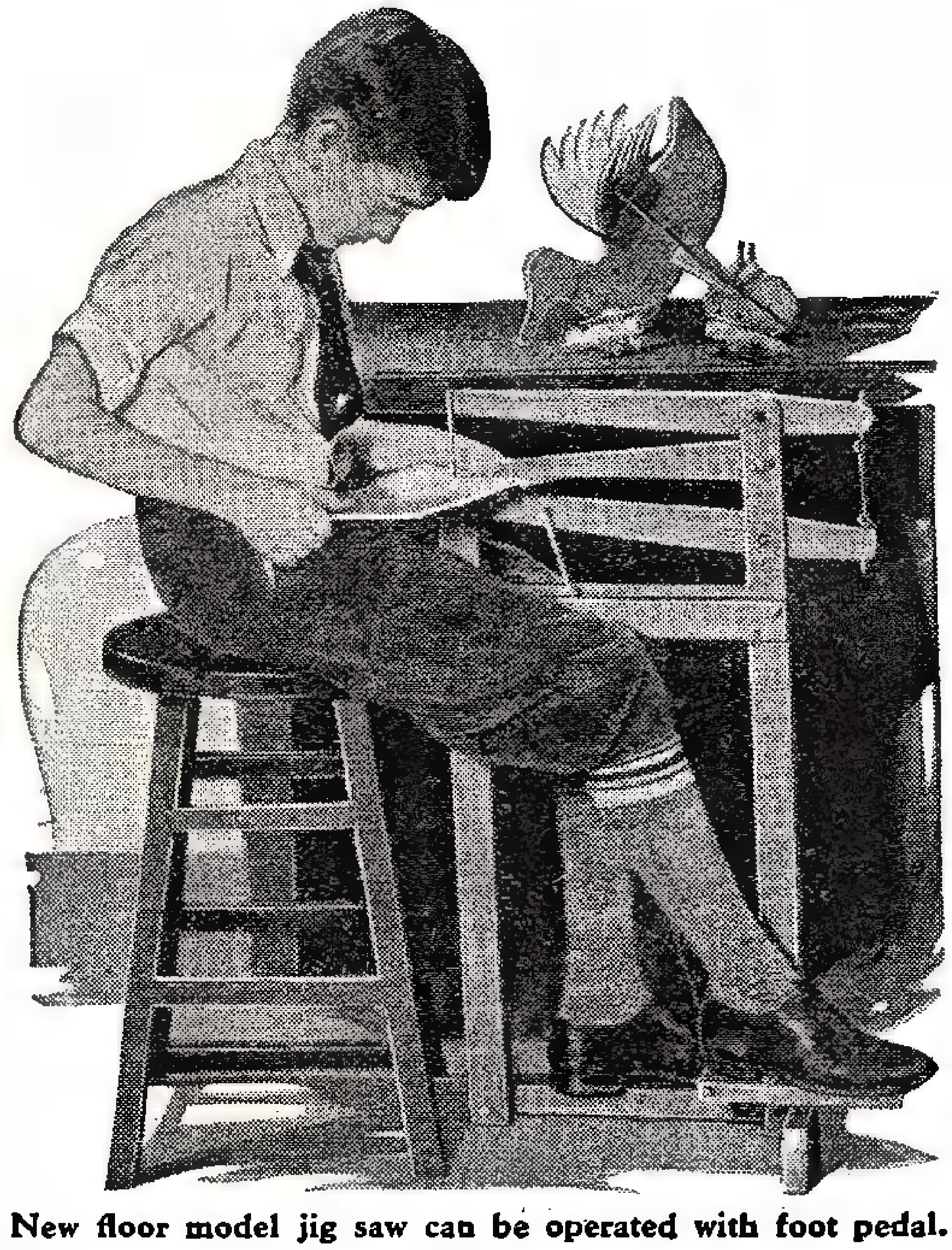
Racquets made by this process are more accurately balanced, and all are exactly the same. Since they cannot warp, no press is needed.

Fine veneer woods are used on the outer layers of the frame and handle, to make the finished product even better in appearance than more expensive hand made racquets.

Jig Saw Operates With Foot

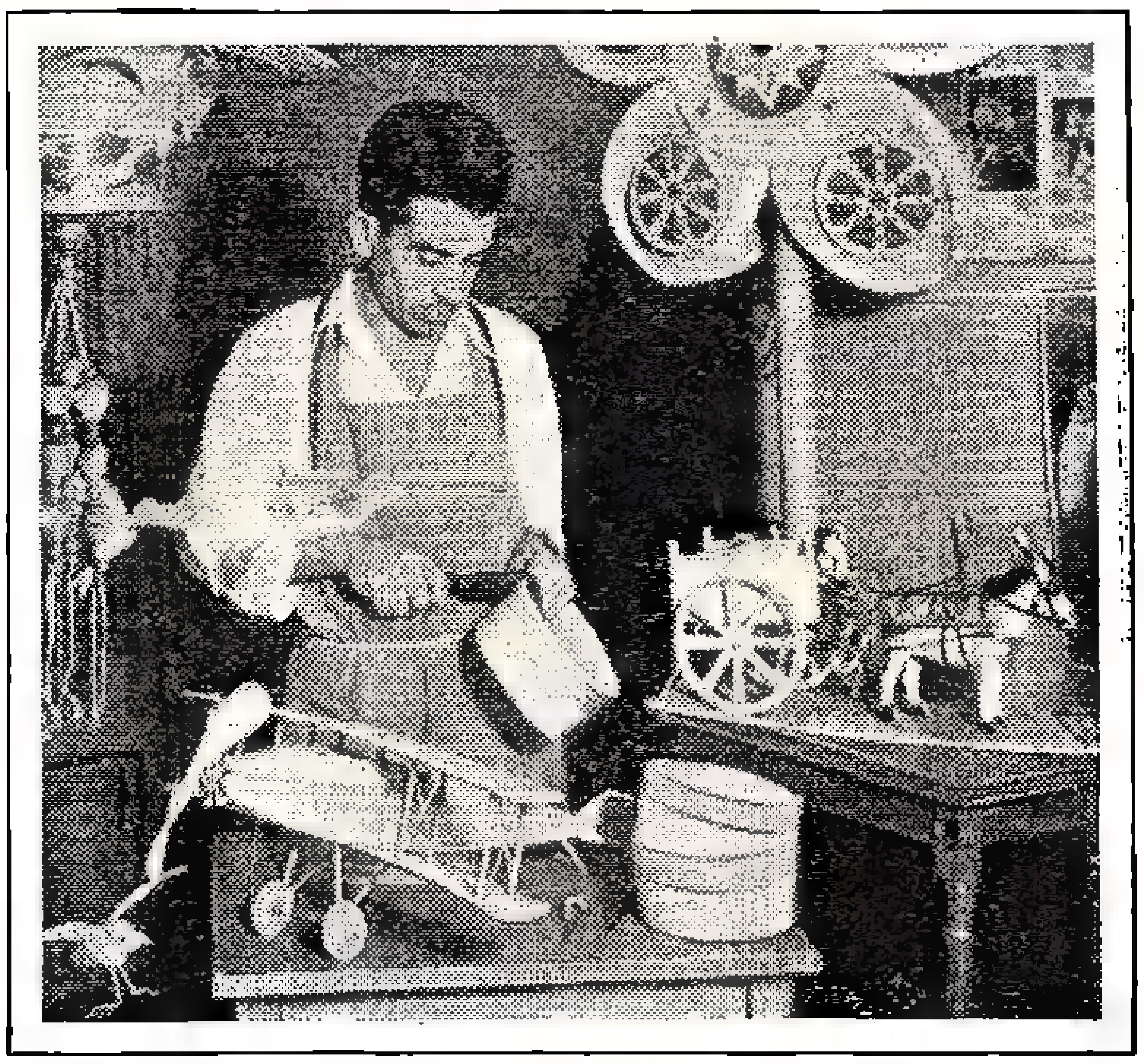
A SIMPLE floor model jig saw which can be operated at working speed with only a foot pedal is now being marketed at a surprisingly low price. The saw is sold knocked down, in package form, to be assembled by the user.

An electric motor, furnished separately, can be attached to the saw in a few minutes. Though the design is simple, and only wood frame members used, there is practically no vibration of the saw blade.



New floor model jig saw can be operated with foot pedal.

Ship Models From Straw Hats

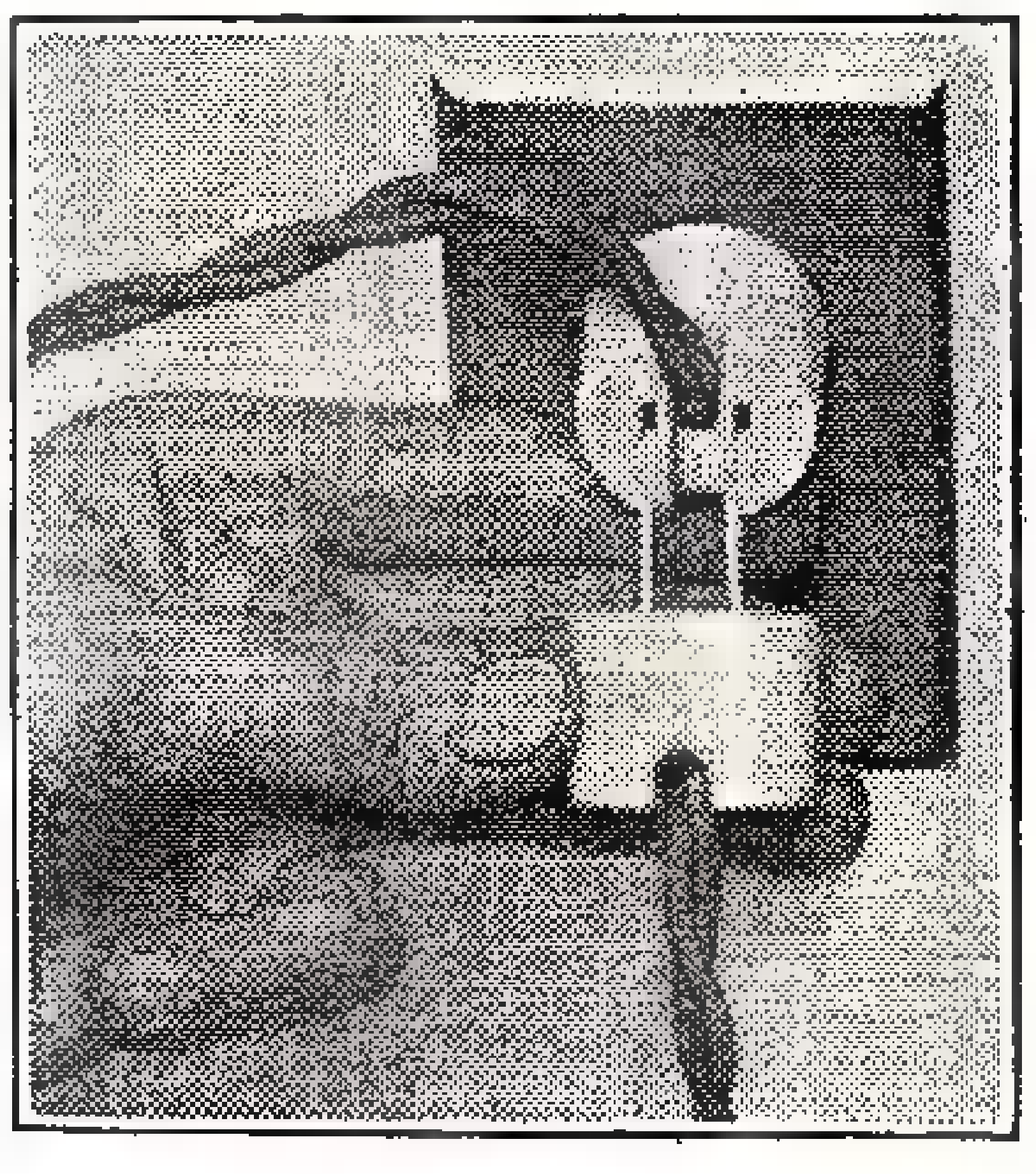


Italian field cart and other models made from old straw hats.

CARL ALAIMO of Atlantic City doesn't throw away any of the old straw hats left at his cleaning establishment—he makes them into novel table decorations, including models of ships, planes, and Italian carts.

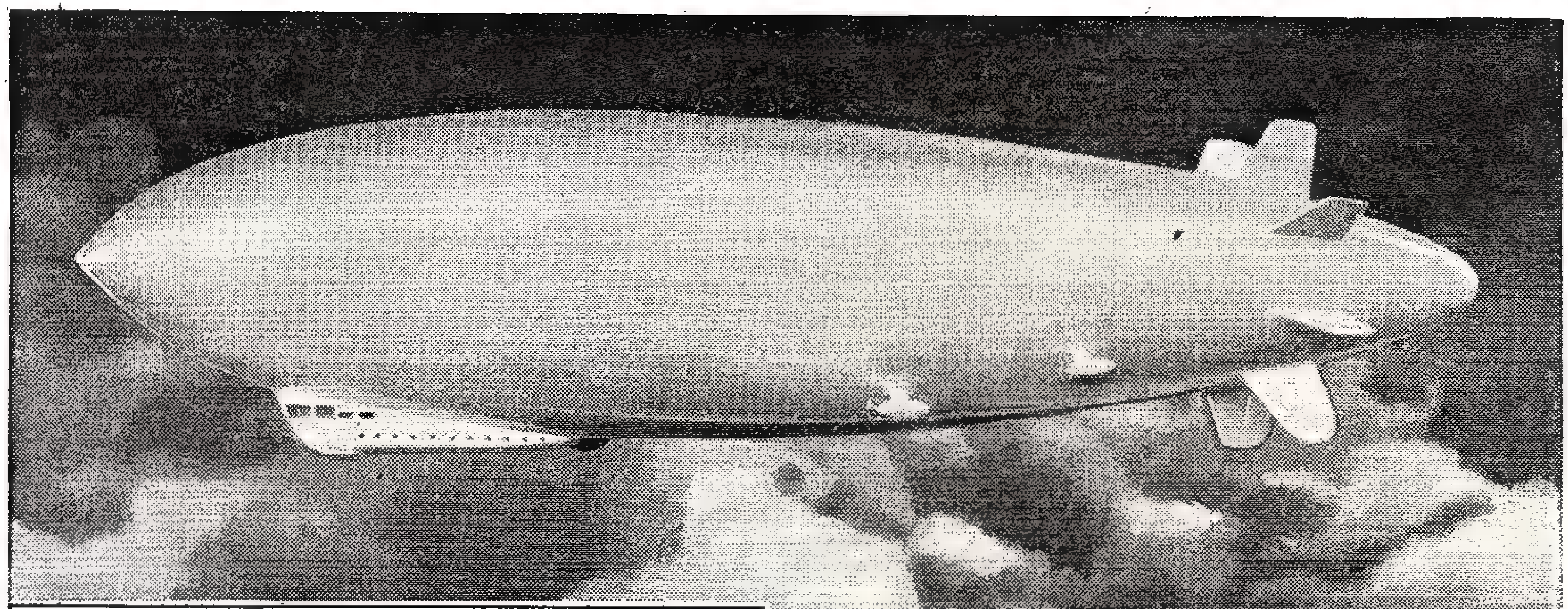
Many Wall Plugs Fit in One Outlet

DOUBLE and triple outlet electric plugs are no longer needed. A novel wall plug now available is of such a design that another plug can be inserted right on top of it. There is no limit to the number of extension cords that can be used on one outlet.

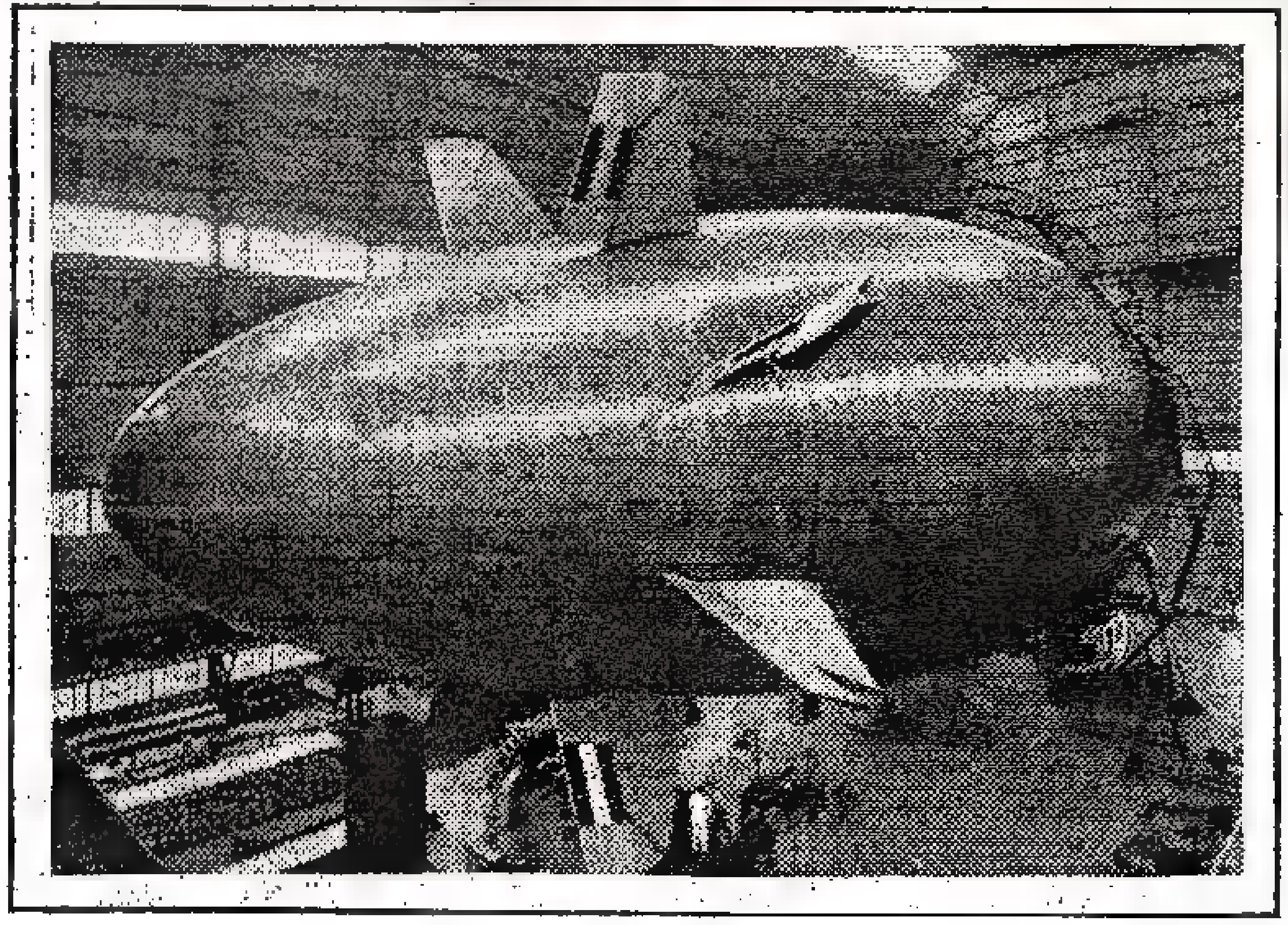


New wall plugs fit on top of each other. Any number of cords can now run to one outlet.

All-Metal Dirigible Will Outrun Storms



The MC-38 as it will appear in flight when completed.



The ZMC-2, first all-metal dirigible, was built for U. S. Navy in 1929. Above is view of ship today in hangar at Detroit, after four years' duty at Lakehurst naval air station.

A FIREPROOF, all-metal dirigible even larger than the *Los Angeles,* and capable of carrying 30 passengers across the Atlantic at 100 miles an hour . . . all this sounds like a dream. It is a dream now, but within a few years this dream will be just as real as the all-metal airplane.

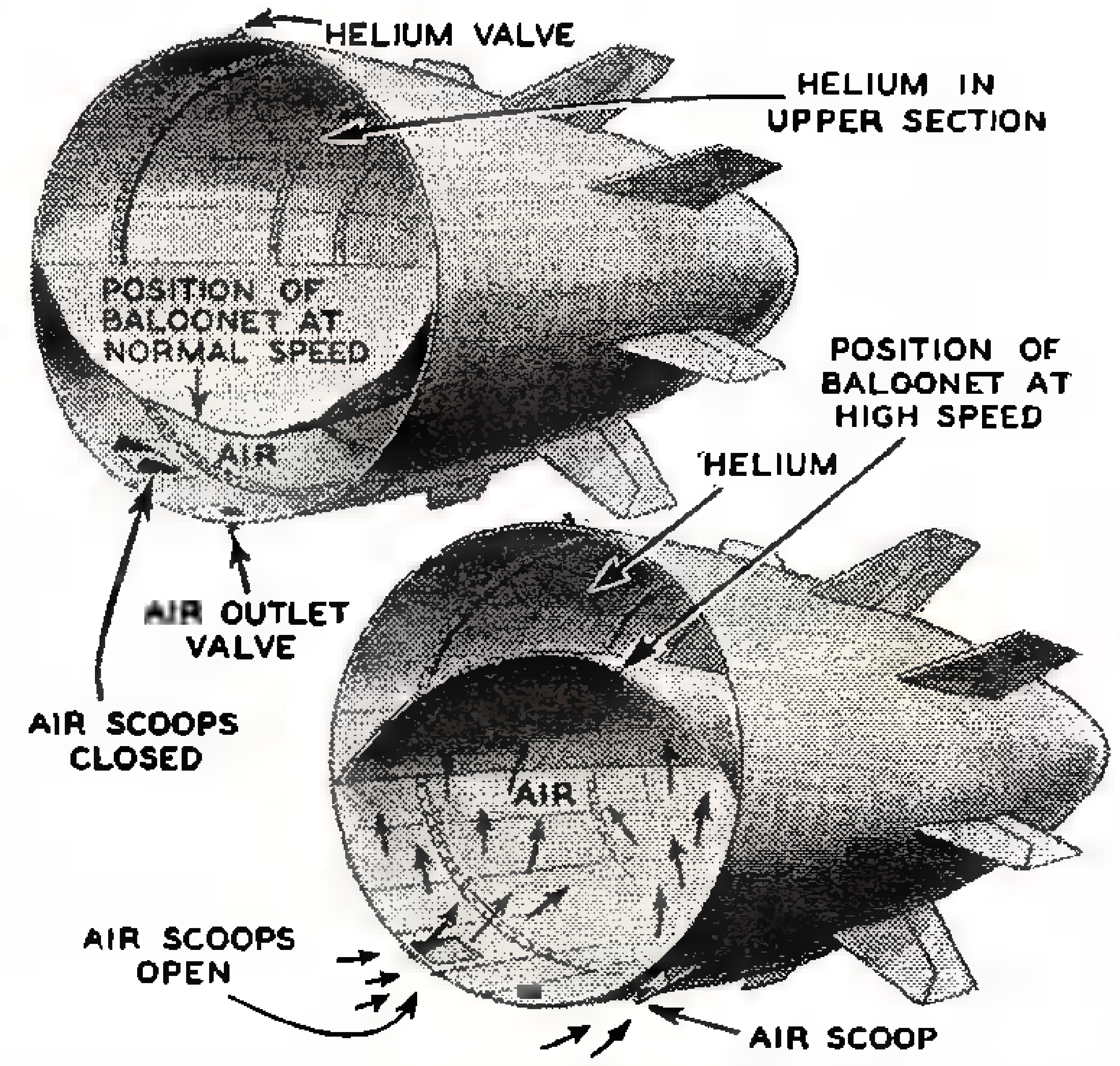
A dirigible with this speed would fear no storms such as wrecked the *Akron,* the *Shenandoah,* and the *R-101.*

After building the first experimental metal dirigible for the United States Navy, the Metalclad Airship Corporation of Detroit has just completed plans for this giant aluminum liner, one of the most fool-proof, fireproof, and storm-proof machines ever invented by man.

Army and navy officials have already promised cooperation and aid in building this huge ship, to be known as the *MC-38.*

A new aluminum alloy, "alclad," in sheets but .0012 inches thick will form the "skin" of the *MC-38.* This sheet metal is no heavier than a piece of heavy paper.

The length of the new ship will be 547 feet. The useful load will be over 36 tons.



Interior diaphragm gives rigidity to ship at high speeds.

Eight gasoline or Diesel engines, delivering more than 5,000 horsepower, will drive the glittering aluminum air giant at a top speed of 100 miles an hour, and a cruising speed of 70 m.p.h. The range of operations will be around 5,400 miles.

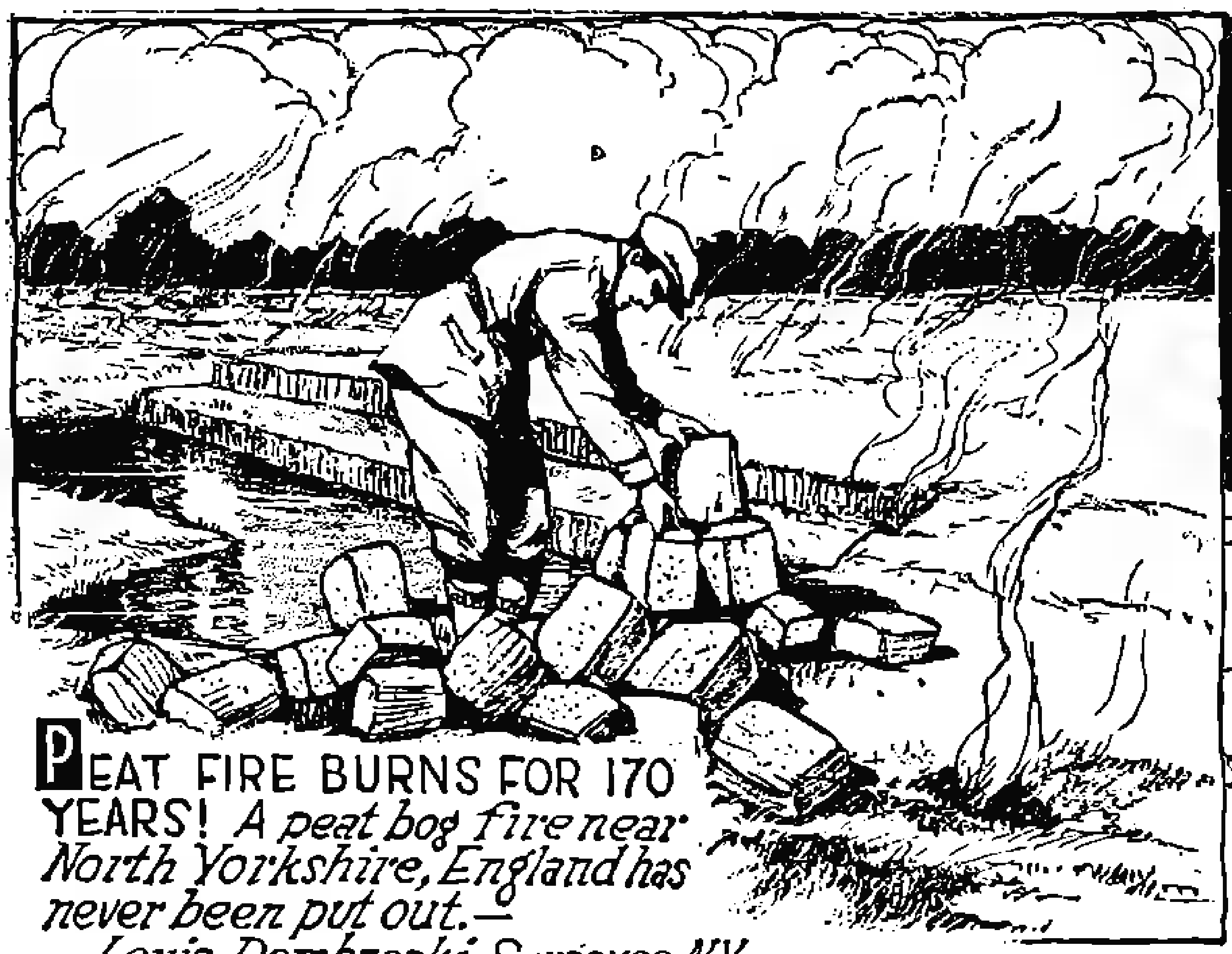
The metal skin itself will serve as gas bag, with only fabric partitions dividing the interior vertically into sections.

The aluminum alloy sheets of the metalclad's skin are "sewed" together by a machine fastening 5000 rivets an hour.

At normal speeds a loose fabric diaphragm is distended downward, the helium gas occupying the greater part of the hull.

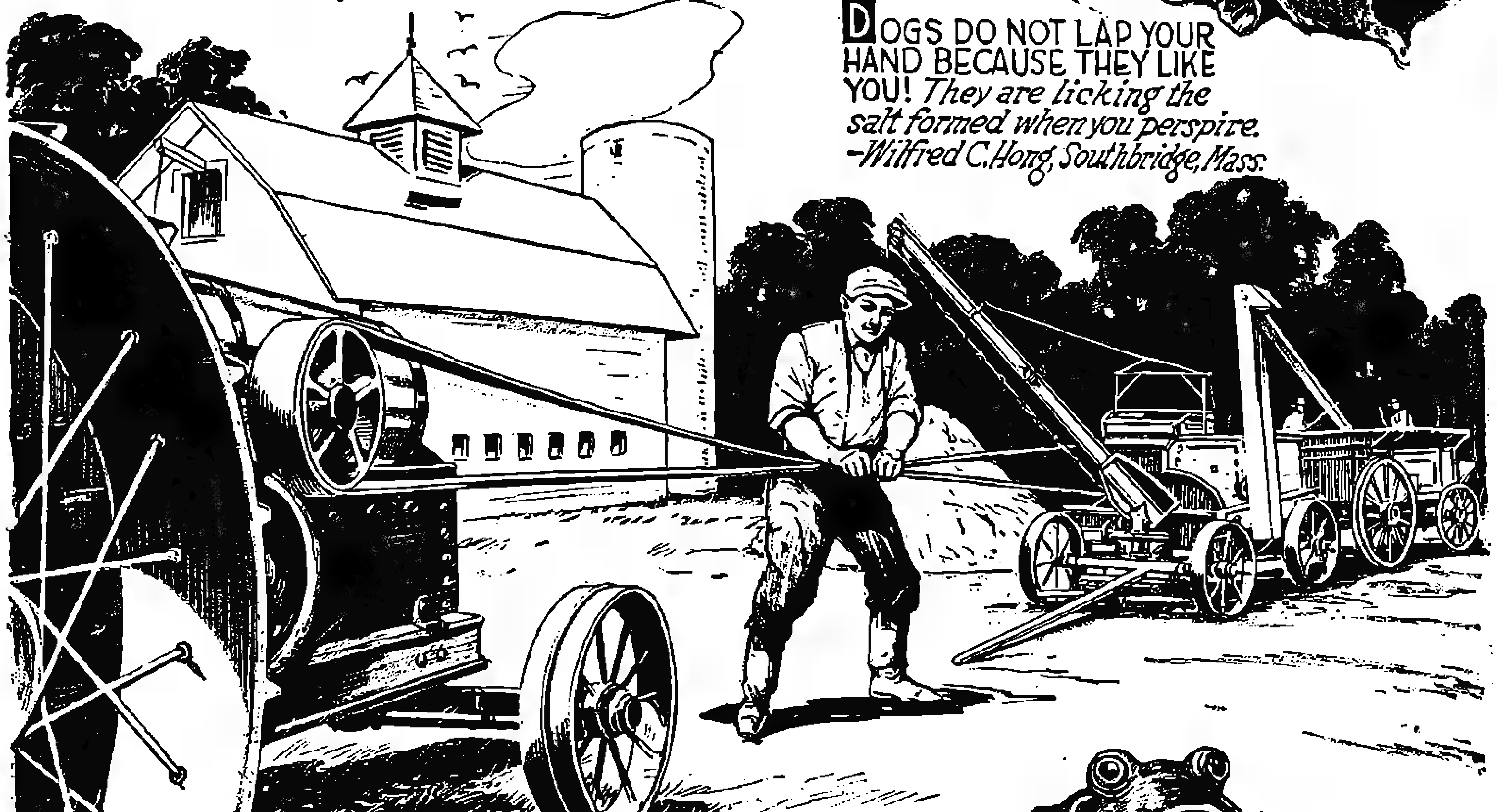
At higher speeds a row of "air-scoops" along the belly of the ship will be opened. Air scooped in forces the diaphragm upward, compressing the helium and making the whole ship rigid.

NIC SPRANK'S ODDITIES of SCIENCE

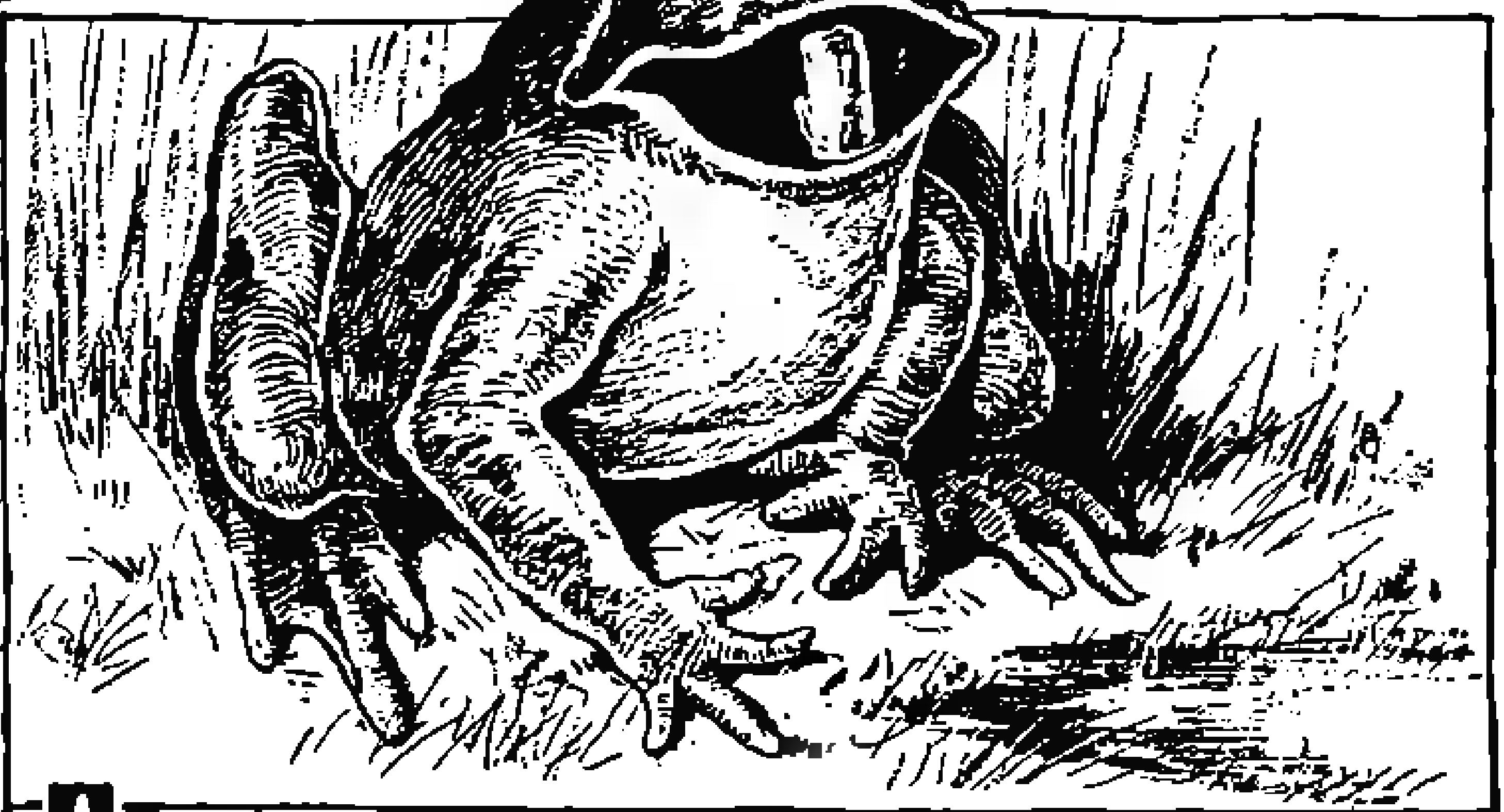


PEAT FIRE BURNS FOR 170 YEARS! *A peat bog fire near North Yorkshire, England has never been put out.*—
Louis Dombroski, Syracuse, N.Y.

DOGS DO NOT LAP YOUR HAND BECAUSE THEY LIKE YOU! *They are licking the salt formed when you perspire.*
-Wilfred C. Hong, Southbridge, Mass.



YOU CAN STOP A 23 H.P. TRACTOR WITH YOUR HANDS! *Grasp the belt where it crosses over, pressing sides together; Friction increases load so much that tractor stalls when clutch is let in.*
—Lynn M. Carothers, Hamilton, Mo.



A FROG WILL SUFFOCATE IF ITS MOUTH IS PROPPED OPEN! *A frog must swallow air with its mouth closed in order to breathe.*—
Vincent M. Merkel, Reading, Pa.

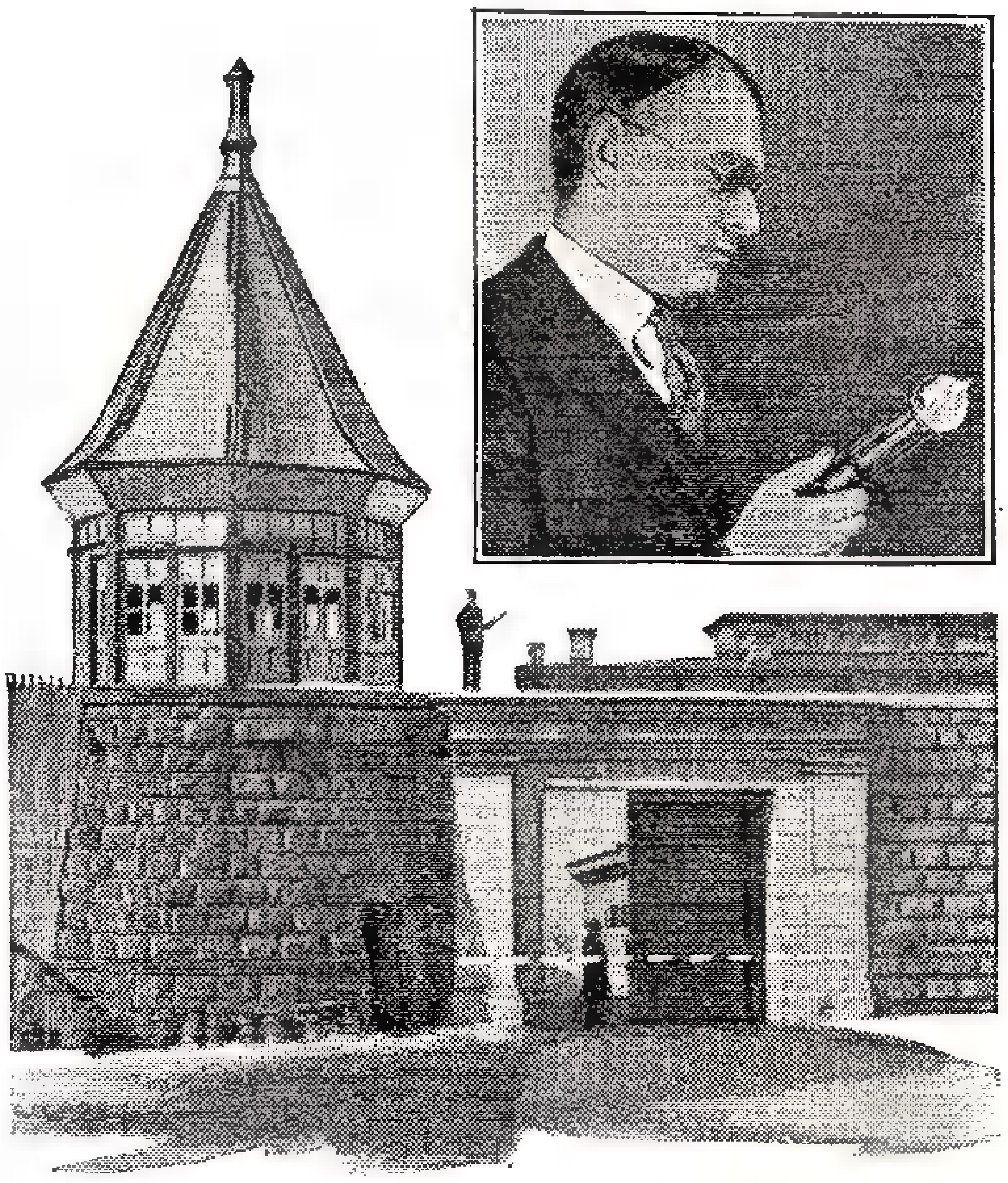
These oddities of science, dealing with things we see or use almost every day, bring to our attention the fact that "all things are not what they seem." Nic Sprank needs more good Oddities—and will pay ONE DOLLAR for each one sent in which he uses. Try your luck! Send in yours, but be sure it hasn't been written up before in this or other publications. Include source of item, and proof if needed. Address Nic Sprank, Modern Mechanix, 529 So. 7th St., Minneapolis.

"Electric Eyes" to Replace Guards at Sing Sing Prison

ONCE again science threatens to supplant the shortcomings of man with infallible apparatus. The electric eye, which never sleeps, is being installed in Sing Sing prison, to replace guards along the outer walls.

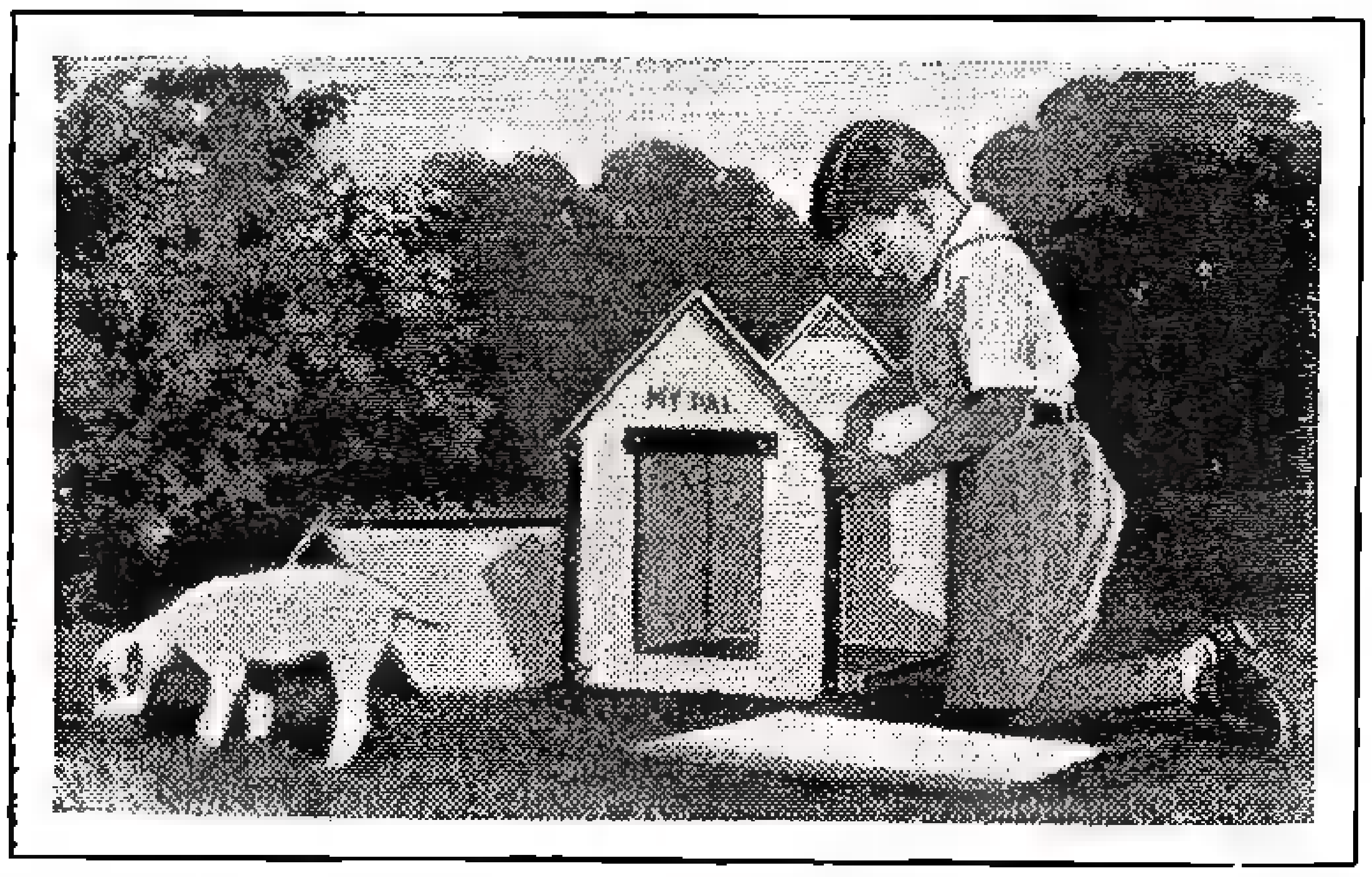
Warden Lewis E. Lawes, after testing a number of photo-electric cell systems on the prison premises, announces "There is no question about it. Installation of a complete electric eye system of alarms throughout the prison would be of tremendous advantage."

Cells will be installed to sound an alarm the moment a person approaches within eight feet of the outer wall. A beam of light traversing the guarded area is focused on the photo-electric cell. The interruption of the beam causes sensitive relays to close and set off the alarm gongs.



Light beams and the "electric eye" will replace guards along walls of Sing Sing prison. Dotted line shows path of beam across gate. Inset: Dr. Zworykin, television inventor, examines new photo-electric cell which may be used in prison.

Dog Houses Now Made of Steel



This attractive metal dog house can be assembled in few minutes. Sides are insulated to keep out cold and heat.

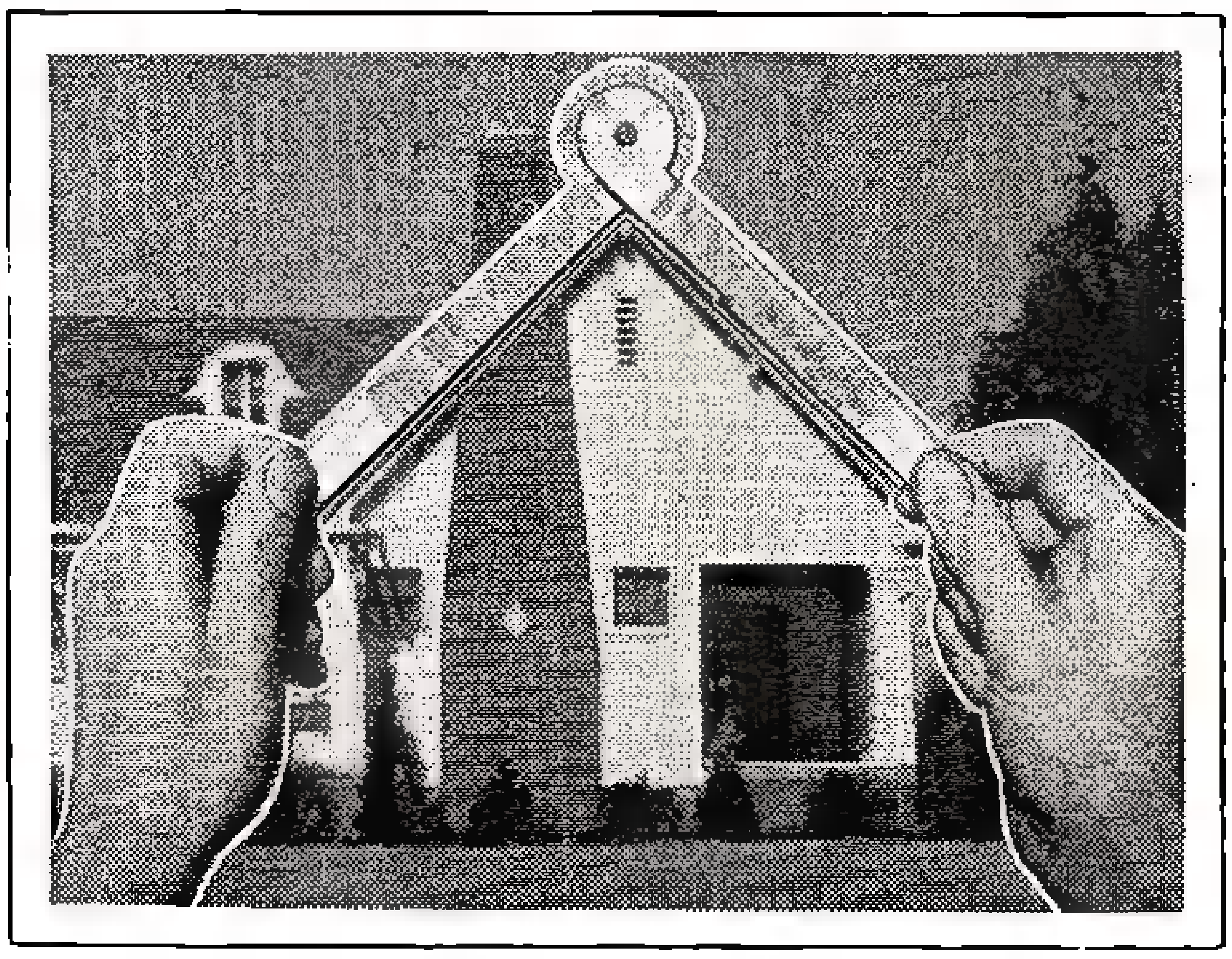
STEEL dog houses that can be assembled in a few minutes are now being made by an Illinois firm. A roof section is removable. Wooden floor can be removed for cleaning. Sides are insulated.

Electric Outboard Does 4½ M.P.H.

ALL-ELECTRIC outboard engines are at last available. Consisting simply of the standard outboard propeller housing and a compact electric motor, they use two auto storage batteries for power. Motor will drive rowboat at 4½ m.p.h.

All electric outboard motor drives canoe or boat at 4½ m.p.h. It runs for 5 hours on two auto storage batteries.

Roof Pitch Measured From Ground



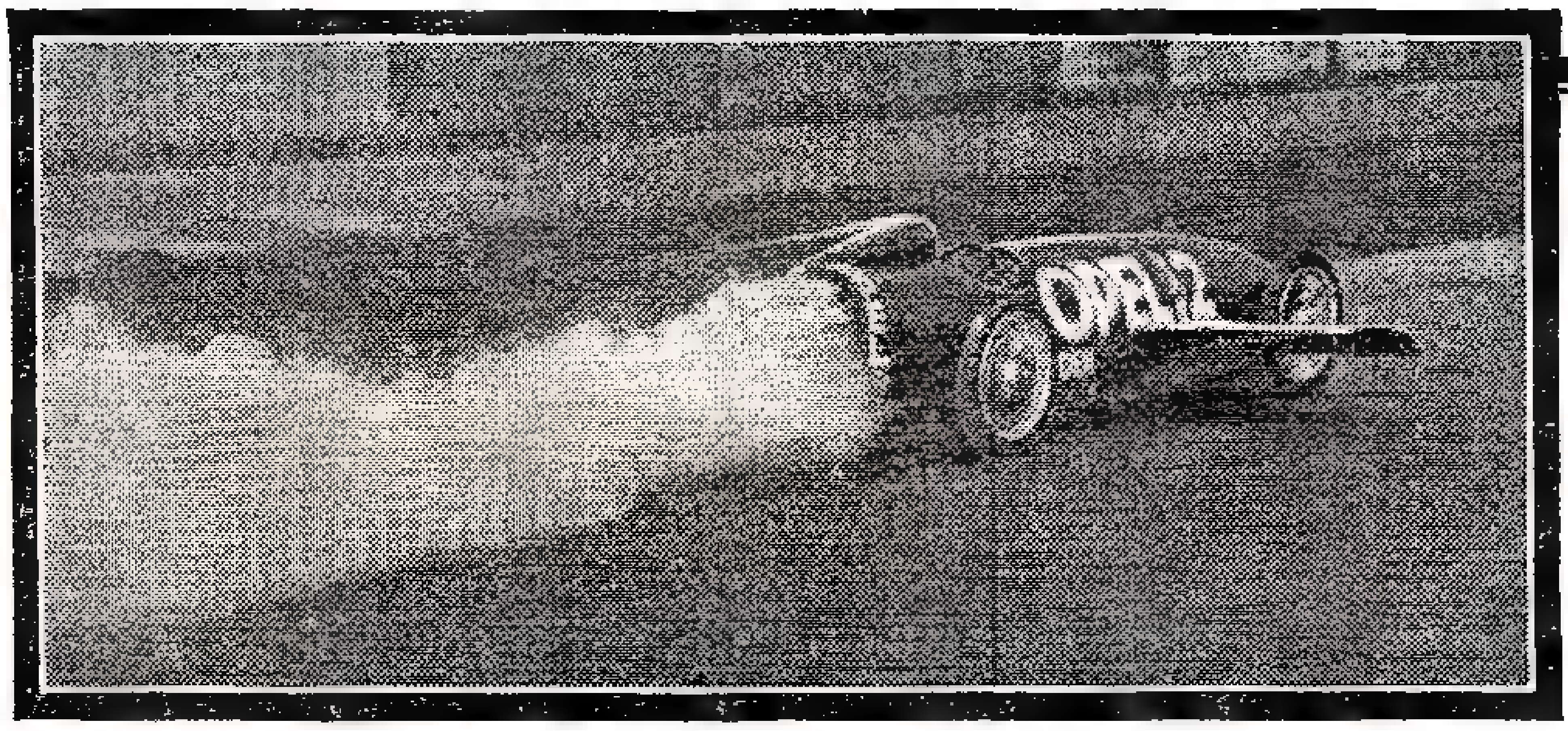
Pitch of any roof can be measured from ground with this handy vest pocket device. Arms are adjusted until inside edges line up with roof surface. Angles are read directly.

THE latest in carpenters' tools is a tiny indicator which measures the pitch of any roof from the ground.

The user stands facing the gable and adjusts the indicator until the roof lines up with the inside edges of the arms. The rise per foot is then read directly off the circular dial. Angles can be measured in degrees in much the same manner. With this tool, roof rafters are easily cut.

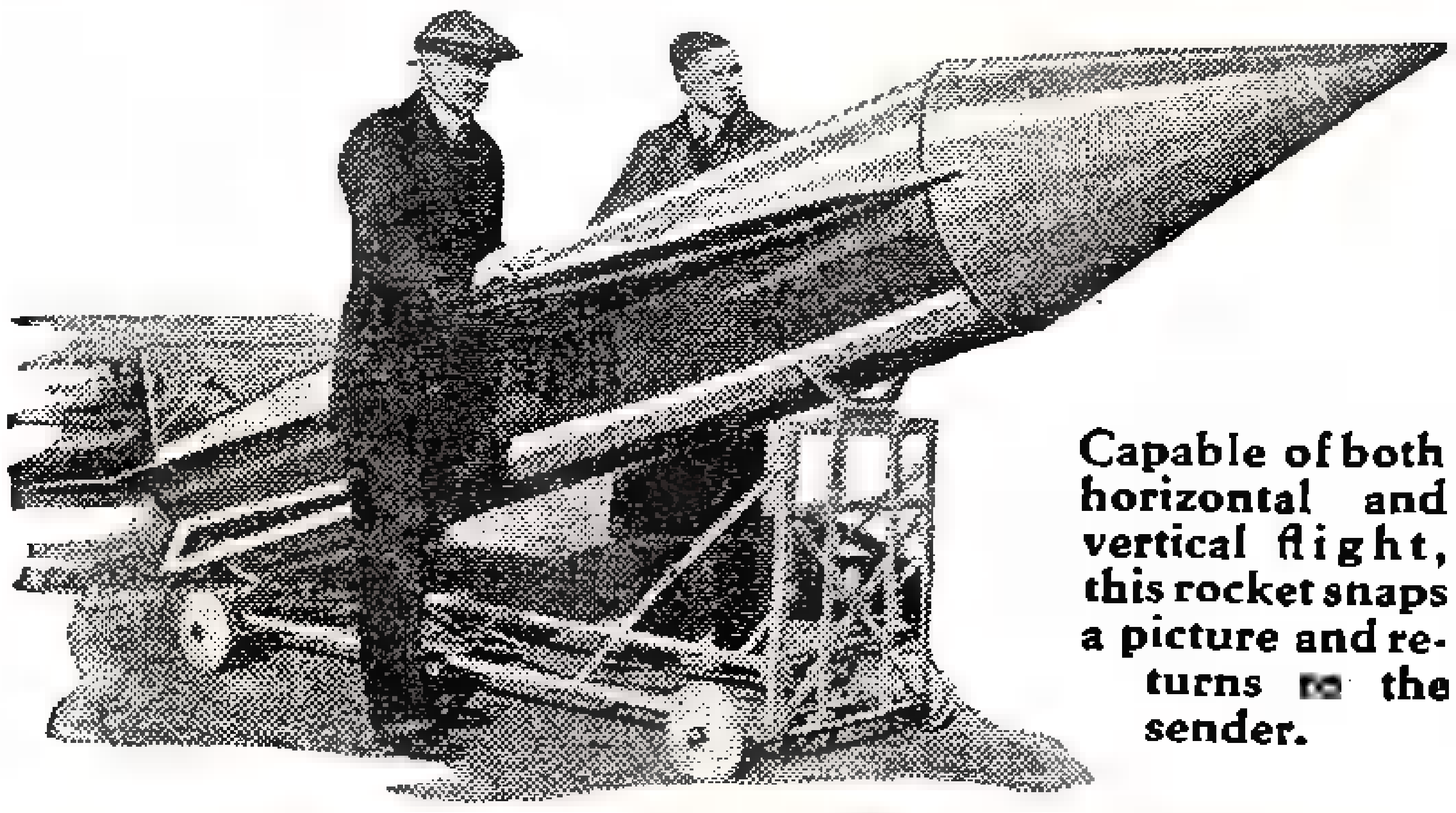
The tool can also be used in the same manner as a protractor, for measuring angles directly. The arms are adjusted until they fit snugly against the angular section being measured, and a reading taken.

Daring Rocket Men to Invade

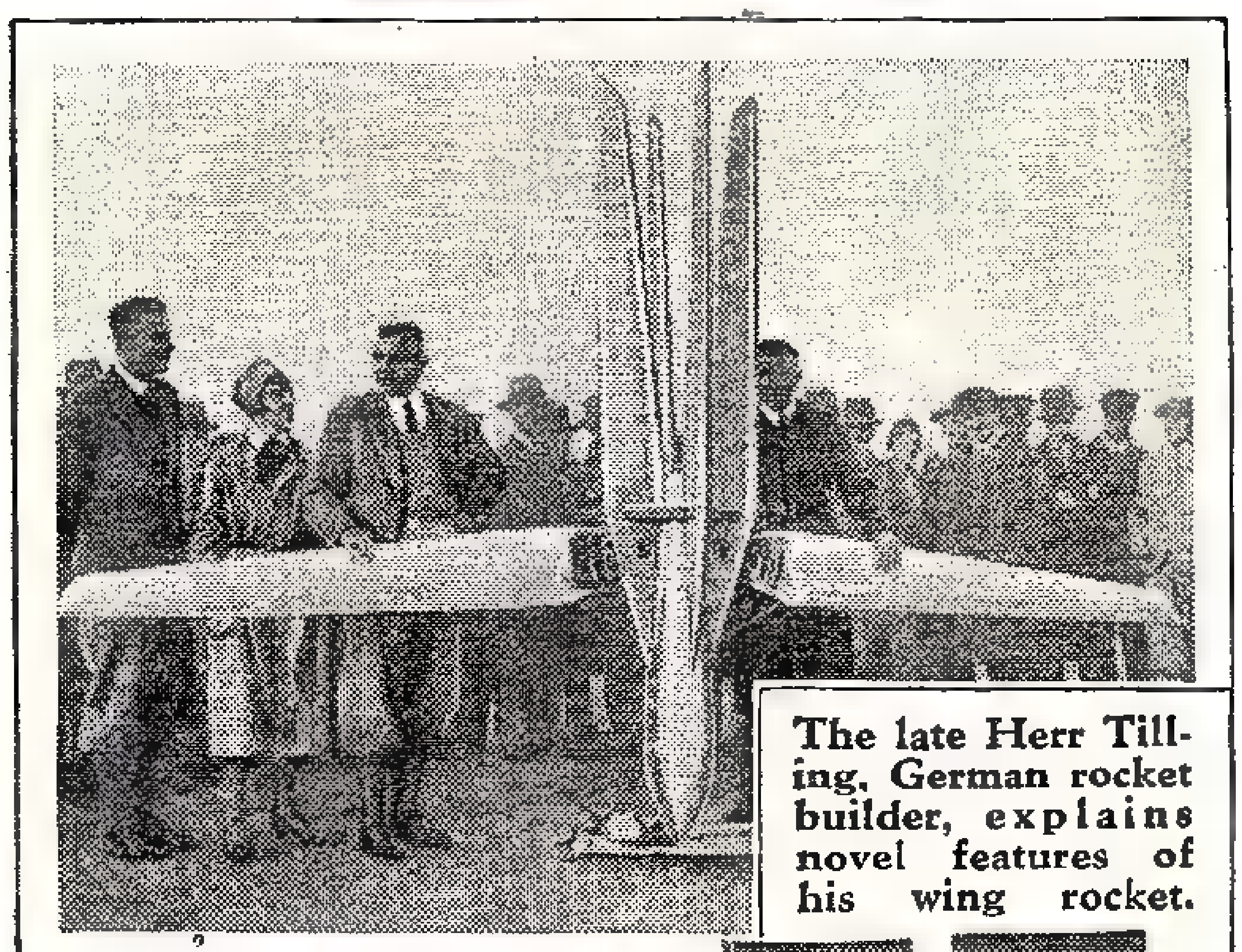


Experimenting with giant rockets, dauntless scientists are planning fresh invasions of the ether. Here is a complete story of their latest projects.

Success of the rocket-driven auto, left, paved the way for conquest of the ether.



Capable of both horizontal and vertical flight, this rocket snaps a picture and returns to the sender.



The late Herr Tilling, German rocket builder, explains novel features of his wing rocket.

Penetration of the stratosphere to a depth of fifteen miles is planned by the Cleveland Rocket Society, here shown conducting a successful test of a new rocket motor. The model motor consists only of a combustion chamber. A highly volatile gas combination is fed through two tubes in the nose. Oxygen is poured through one inlet and gasoline under 250 pounds pressure through the other.

THE rocket-shooters are going to pitch in again this coming summer. Undaunted by reverses and tragedies during the past year's experiments, the rocketeers are tackling their work with renewed vigor and ambition, plus improved apparatus and chemicals.

Ernst Loebell, famous German engineer and rocket designer, promises to bring the rocket engines to their greatest point of achievement next summer. He is now in this country and is an active worker in the Cleveland Rocket Society.

Loebell has been carrying on his preliminary experiments on the big Hanna estate in a suburb of Cleveland. In their operations the Cleveland group has been making use of the lessons taught by the experiments of Loebell's countryman, the late Reinhold Tilling, a noted radio engineer and rocket builder.

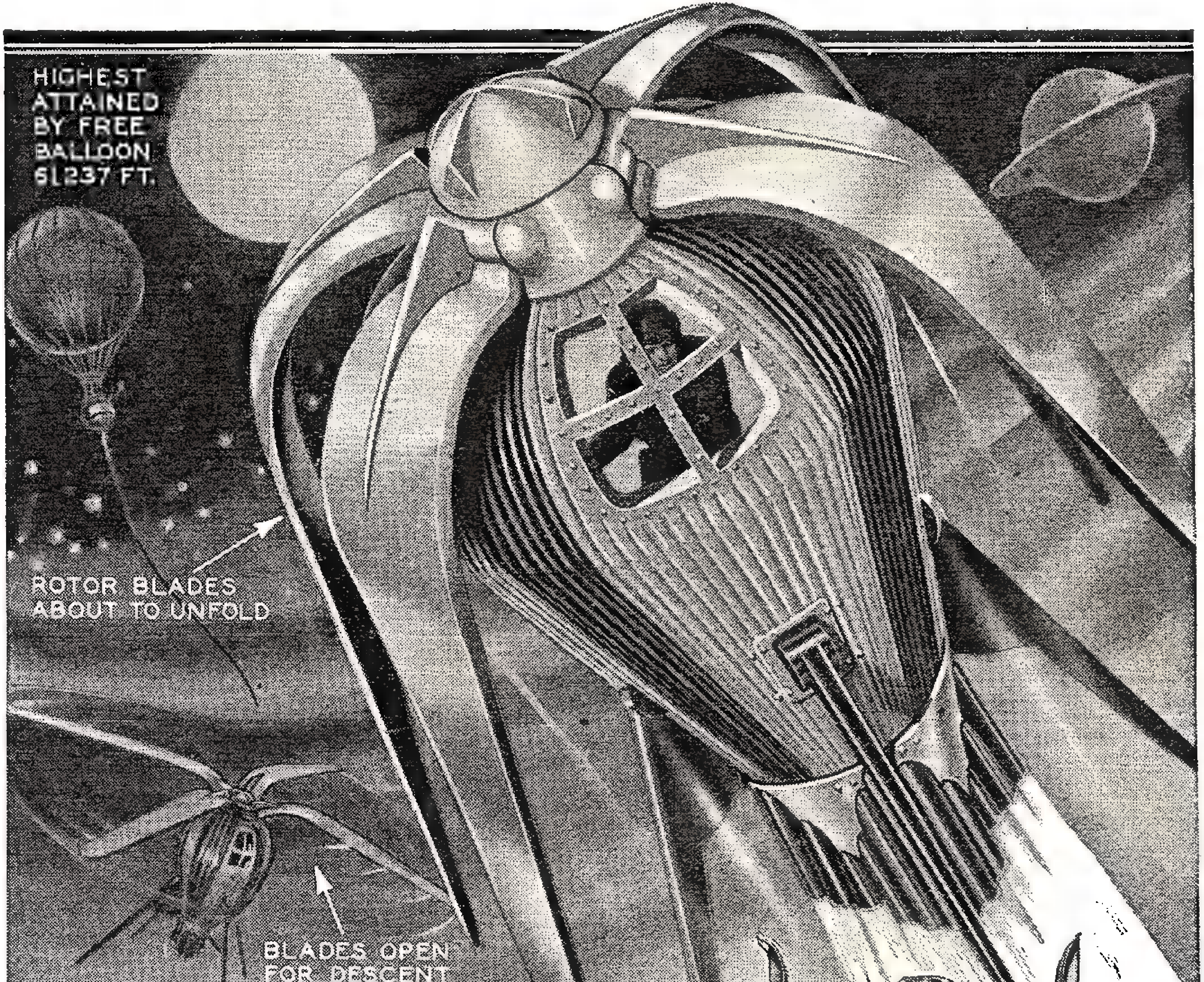
Prior to his death, Tilling had been experimenting with rockets and rocket planes for months. The success of a rocket which reached a height of 6,000 feet in 1931 spurred him on to the construction of a rocket with glider wings which unfolded when the fuel was exhausted and brought the projectile gently to earth. This feat was hailed as one of the first practical steps toward the development of mail and passenger carrying rockets.

The Tilling rockets were set in motion by telignition from a distance of 100 yards. They attained a speed of 700 miles an hour and landed five miles from the starting point, in accordance with calculations. Herr Tilling was working on a system designed to manipulate his rockets by radio control when he and a female assistant were killed in the explosion of a rocket which they were charging.

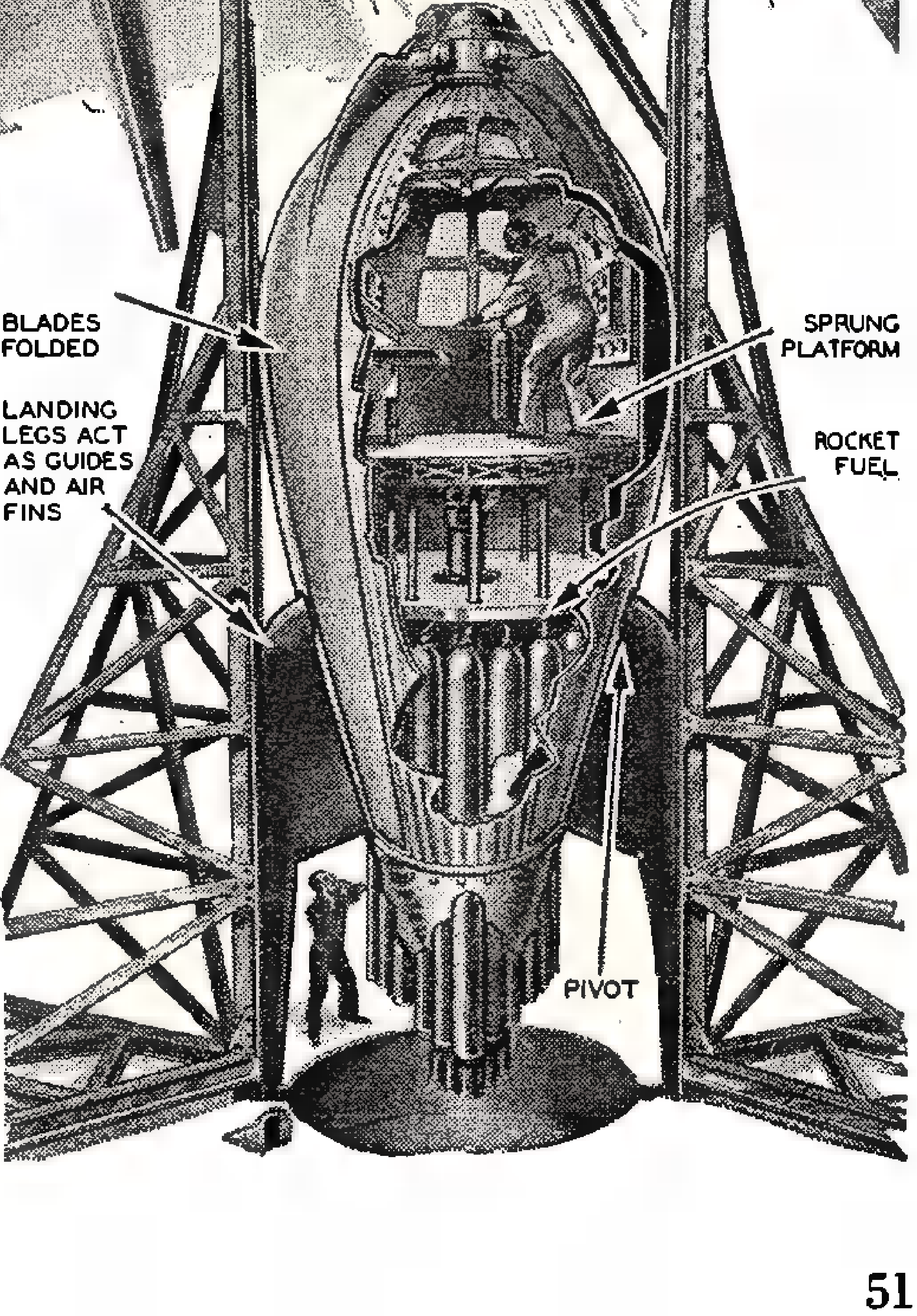
Such information as emanated from the secrecy surrounding Tilling's operations at Osnarbrueck, Germany, has since been in the possession of the Cleveland Rocket

the STRATOSPHERE

by ALFRED ALBELLI


HIGHEST ATTAINED BY FREE BALLOON 61237 FT.
ROTOR BLADES ABOUT TO UNFOLD
BLADES OPEN FOR DESCENT

An artist's conception of the man-carrying rocket of the future. Note autogyro vanes which float the rocket back to earth when power is spent, allowing it to settle gently on landing fins.


BLADES FOLDED
LANDING LEGS ACT AS GUIDES AND AIR FINS
SPRUNG PLATFORM
ROCKET FUEL
PIVOT

Society's guiding geniuses. They plan to adopt the Tilling heritage and carry his work to further perfection.

Ernst Loebell and his assistant, Ted Hanna, have also investigated another secret German rocket—that of the famous Fischer brothers, details of which have also been closely guarded. The Fischers have achieved the biggest advance thus far in the field of passenger rocket flying.

The Fischers pursued their experiments on the island of Rugen in the Baltic Sea under the auspices of the German War Ministry. Otto Fischer, brother of Bruno, who designed the rocket, was shot up 32,000 feet, more than six miles, into the air in a 24-foot steel projectile.

At the peak of the rocket's trajectory, Otto released a parachute attached to the

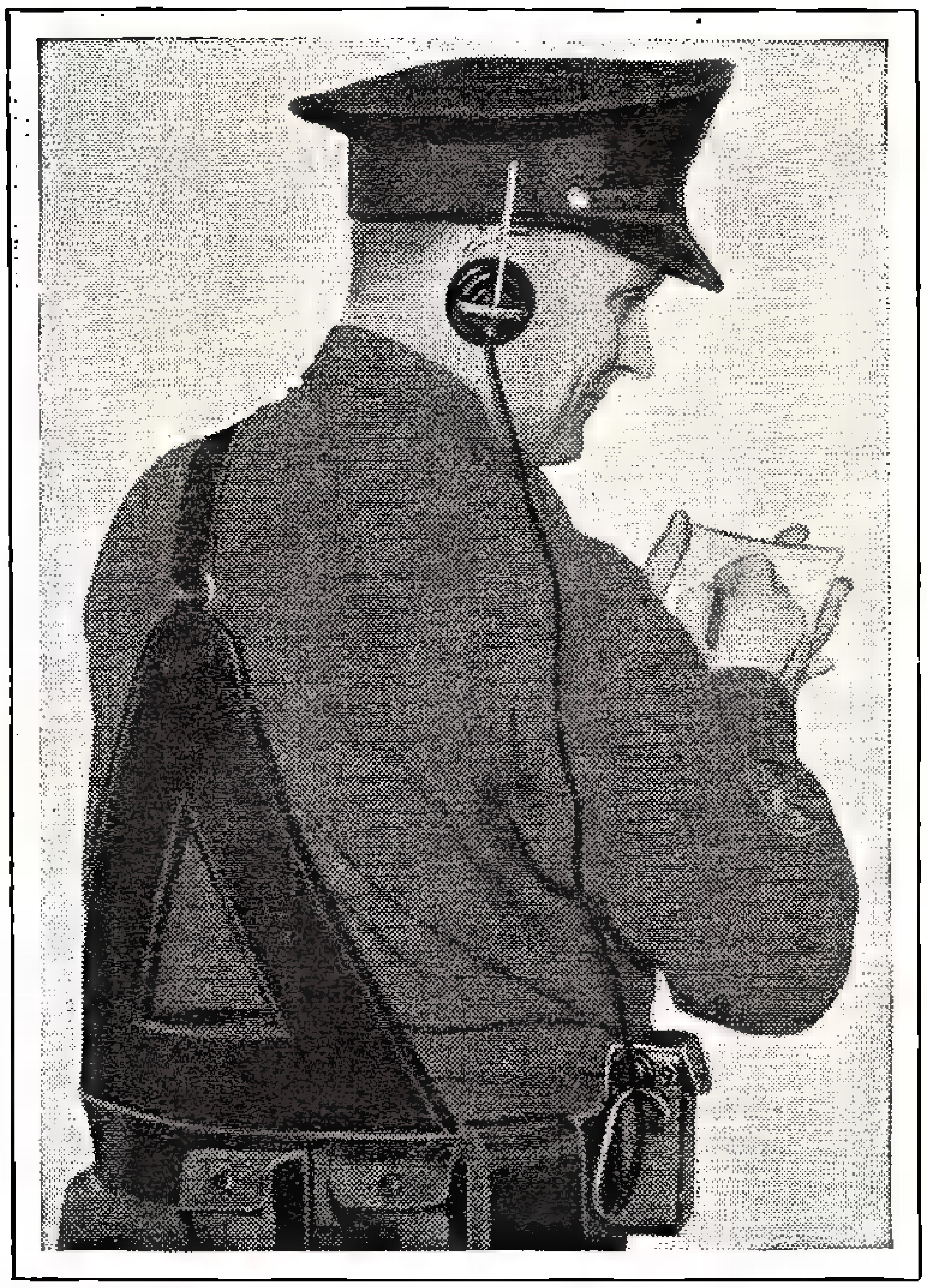
(Continued on page 118)

Police Hear Calls on New Midget Radios Built Into Belts

RADIO amateurs of Los Angeles have designed a tiny radio set that can be built in as an integral part of any police officer's Sam Brown belt. A single headphone clips on the officer's cap.

With these radios traffic officers and patrolmen will hear every call broadcast by the police radio transmitter. Traffic in an entire city could be blockaded within a few minutes after an alarm, in case of bank robberies.

The new invention marks a great forward stride in the field of crime prevention. Police can now work as a unit, under the control of one officer at headquarters, rather than as scattered units difficult to contact in emergencies.



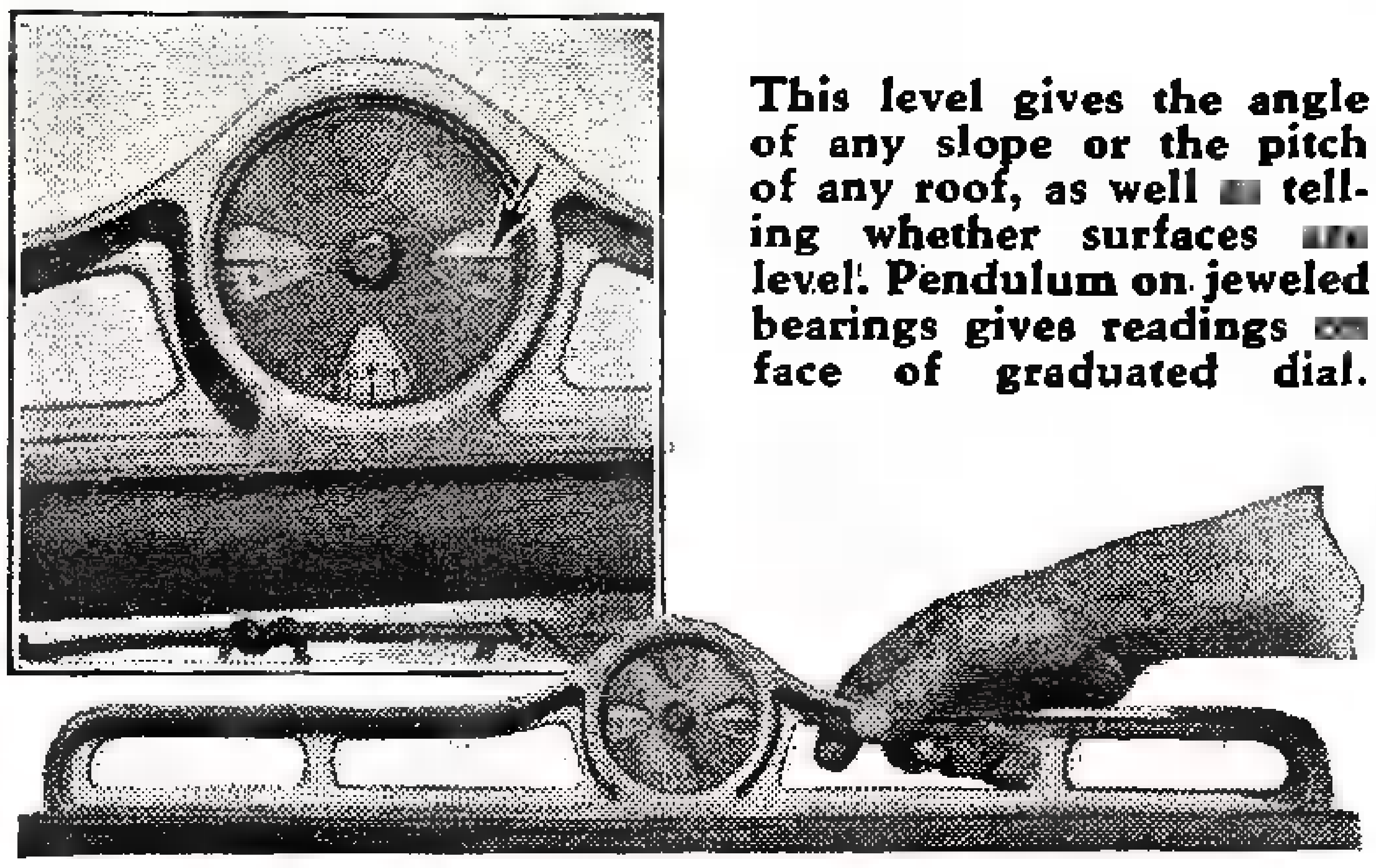
New police radio set designed for traffic officers and patrolmen is built into Sam Brown belt. Single headphone clamps on cap. Aerial is built into belt. Dry cells are used.

"Heavy Water" Intoxicates Mouse

A MOUSE named Oscar frisked about strangely in the scientific laboratories of the University of California, after being given a drink of the new "heavy water," even losing all interest in a tempting bit of cheese. The fluid contains hydrogen "isotropes," twice as heavy as ordinary hydrogen.

Level Measures Slopes and Angles

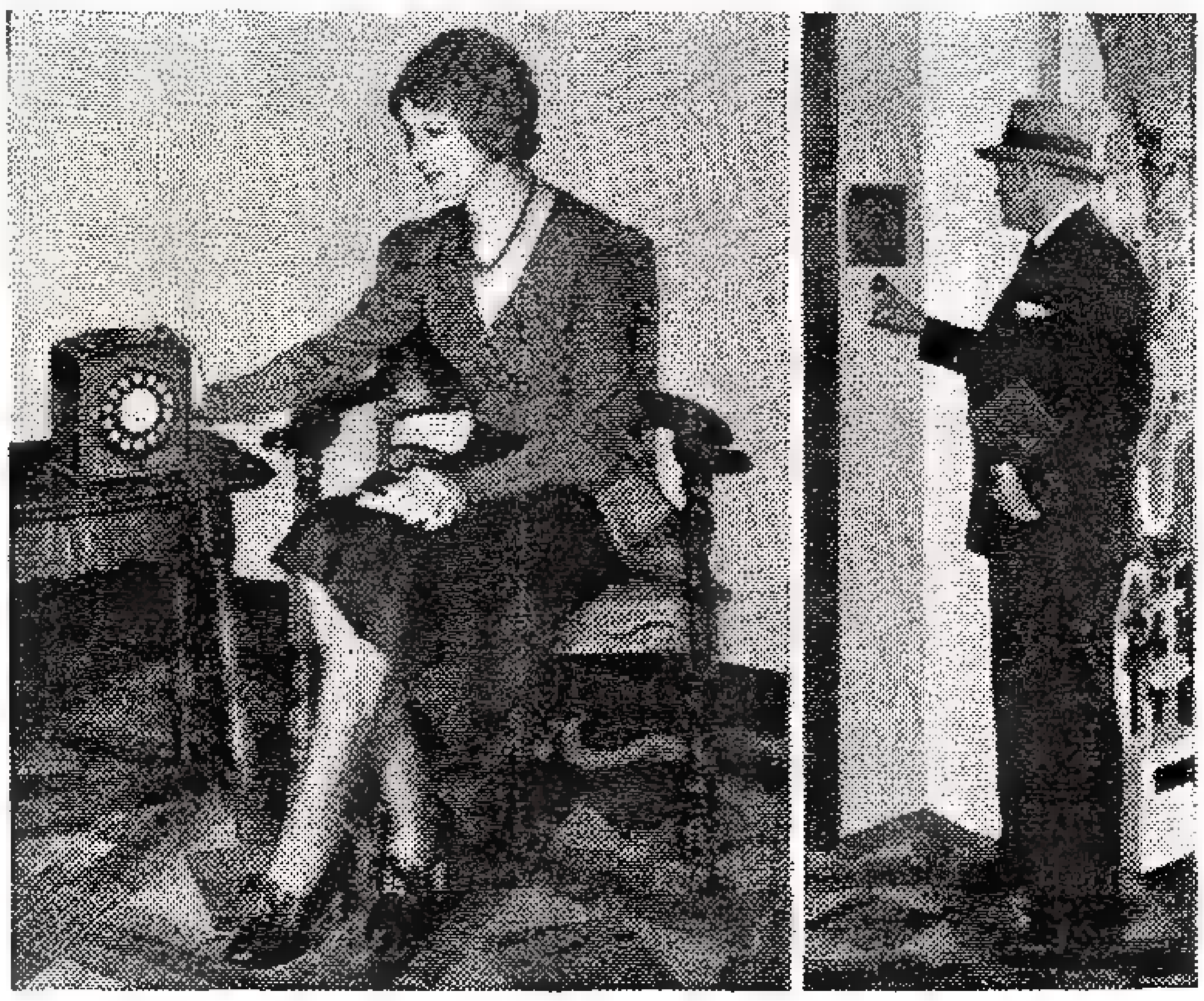
A NEW pendulum type level, in addition to telling whether a certain surface is level, tells exactly how far from being level it is. The pitch of a roof can be quickly read on the graduated dial. On the reverse side slopes in inches to the foot are read off directly.



This level gives the angle of any slope or the pitch of any roof, as well as telling whether surfaces are level. Pendulum on jeweled bearings gives readings on face of graduated dial.

"Mike" Set Answers Doorbell

HOUSEWIVES need no longer run downstairs each time the doorbell rings. By pushing a button on a new combination speaker and receiver, she can hear the caller's voice from any desired point in the house. A combination receiver and microphone unit is built into the outside door frame to pick up the caller's voice. Friends can be identified by their voices, while peddlers may be dismissed without even opening the door.



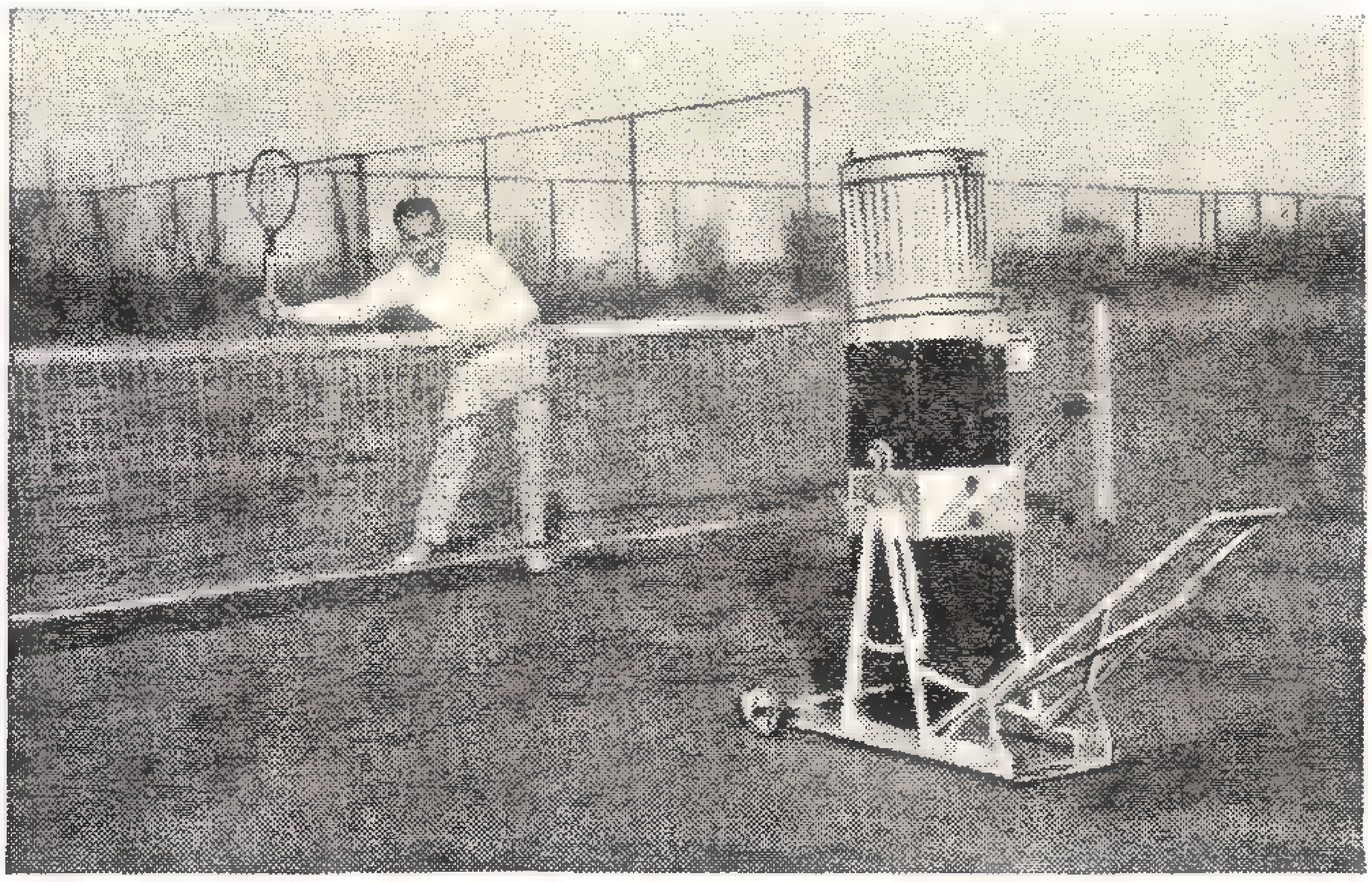
The doorbell can be answered from any room having "mike" unit on table at left. Combination receiver and microphone is built into door frame, as shown at the right.

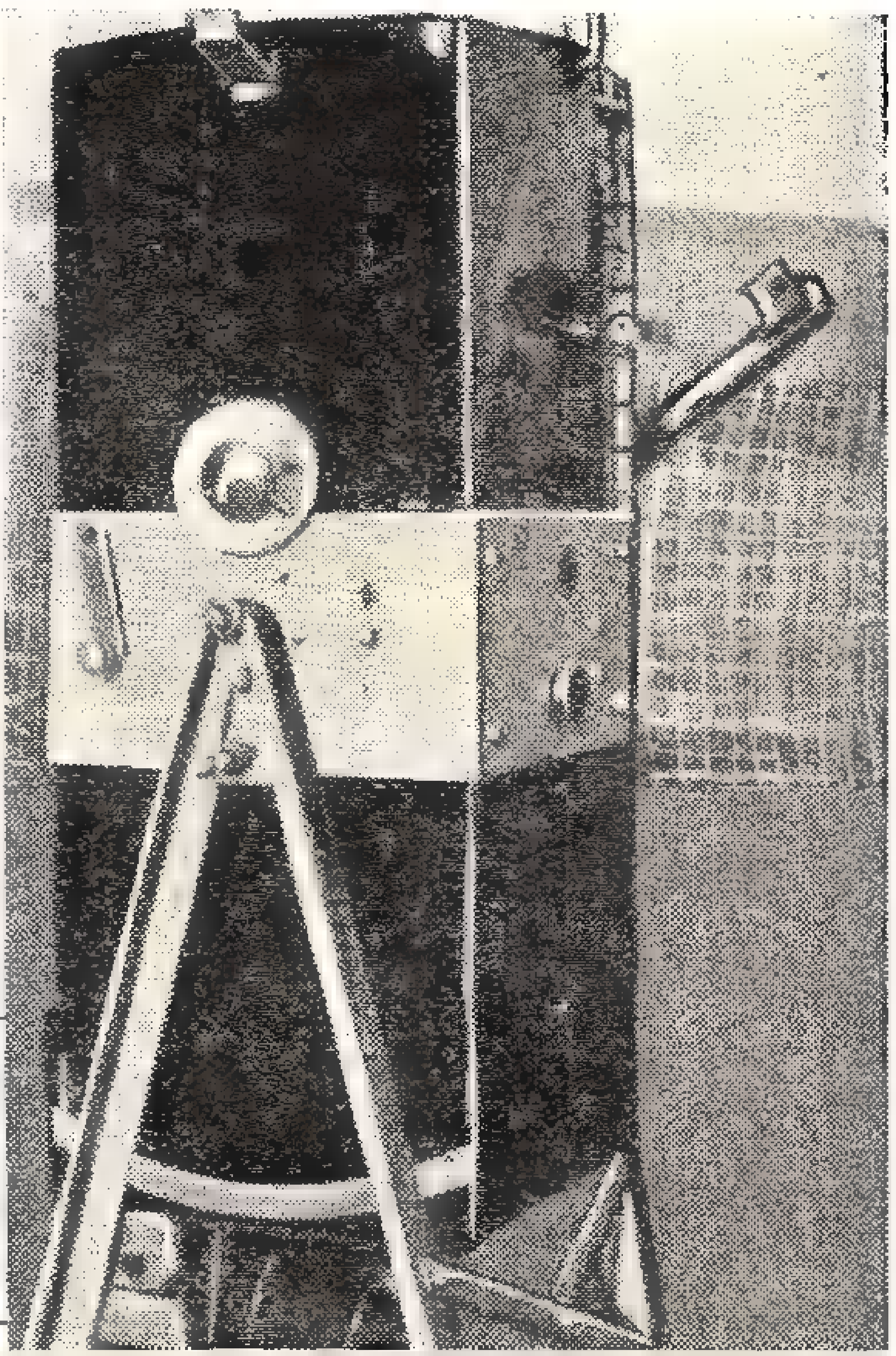
Handwriting of Twins Can Be Same

FOR centuries it was believed that no two persons had the same handwriting.

Robert Saudek, London graphologist, examining the handwriting of identical twins, found that 5% of them wrote exactly the same hand. Others wrote enough alike to deceive bank tellers completely, and to make handwriting experts hesitate.

Robot Tennis Player BEATS EXPERTS





The tennis robot is put through its paces in net play practice, above. At right, a closeup of the machine, showing the dial regulating the number of balls served. The lever left of the dial controls placement strokes and operates a tilting device permitting a change to drive or lob shots. Mechanism will bat 60 balls across net without stopping, at rate of 60 per minute.

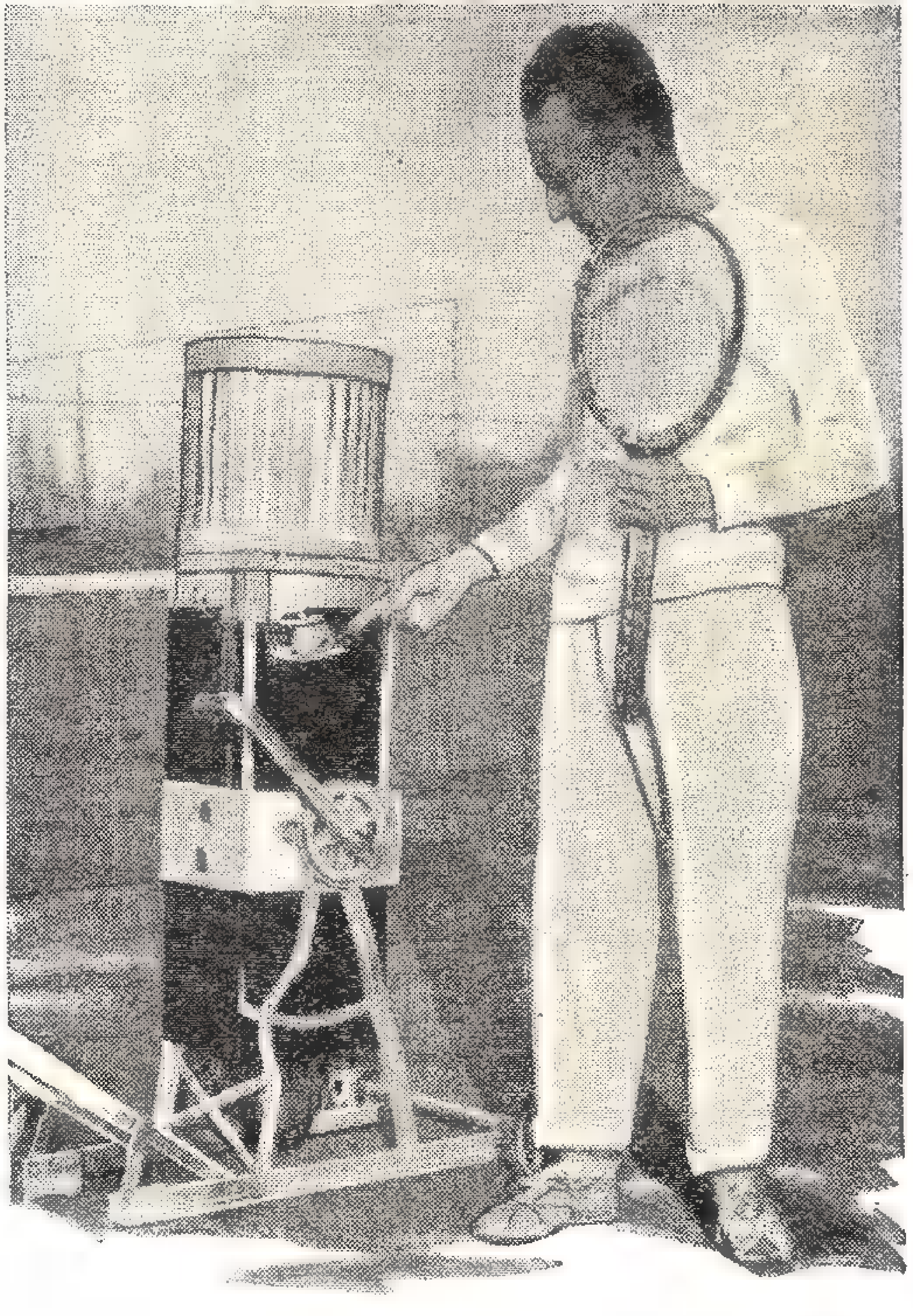
PITTING their skill against the strokes of a mechanical tennis player in a recent exhibition, St. Louis racquet stars found themselves deluged by a barrage of deceptive lobs and smashing serves which drove them to the base line and forced them to net several of their returns.

The invention of Edward Serrano, winner of the St. Louis district doubles crown in 1932, the robot will do practically anything the human tennis player can do except return the ball. Mounted on a movable, two-wheeled frame, the iron body of the machine is crowned by a bucket-like head which contains sixty balls. A striking bat, powered by a small electric motor, serves, lobs or drives the balls as they are fed automatically from the hopper into a dish-like receptacle.

Various adjustments permit a wide latitude of strokes. Hitting toward the top of the striking surface results in a top-spin drive; hitting toward the bottom produces an under-cut stroke. When the robot is called upon to lob it is adjusted backward until its "head" forms an acute angle with the ground, much like the wartime trench mortars. The serve is executed merely by slowing up the drive.

The mechanism is adjusted to bat sixty balls across the net without stopping at a rate of about six to the minute, the approximate time required for the forth-and-back flight of a ball stroked at average speed.

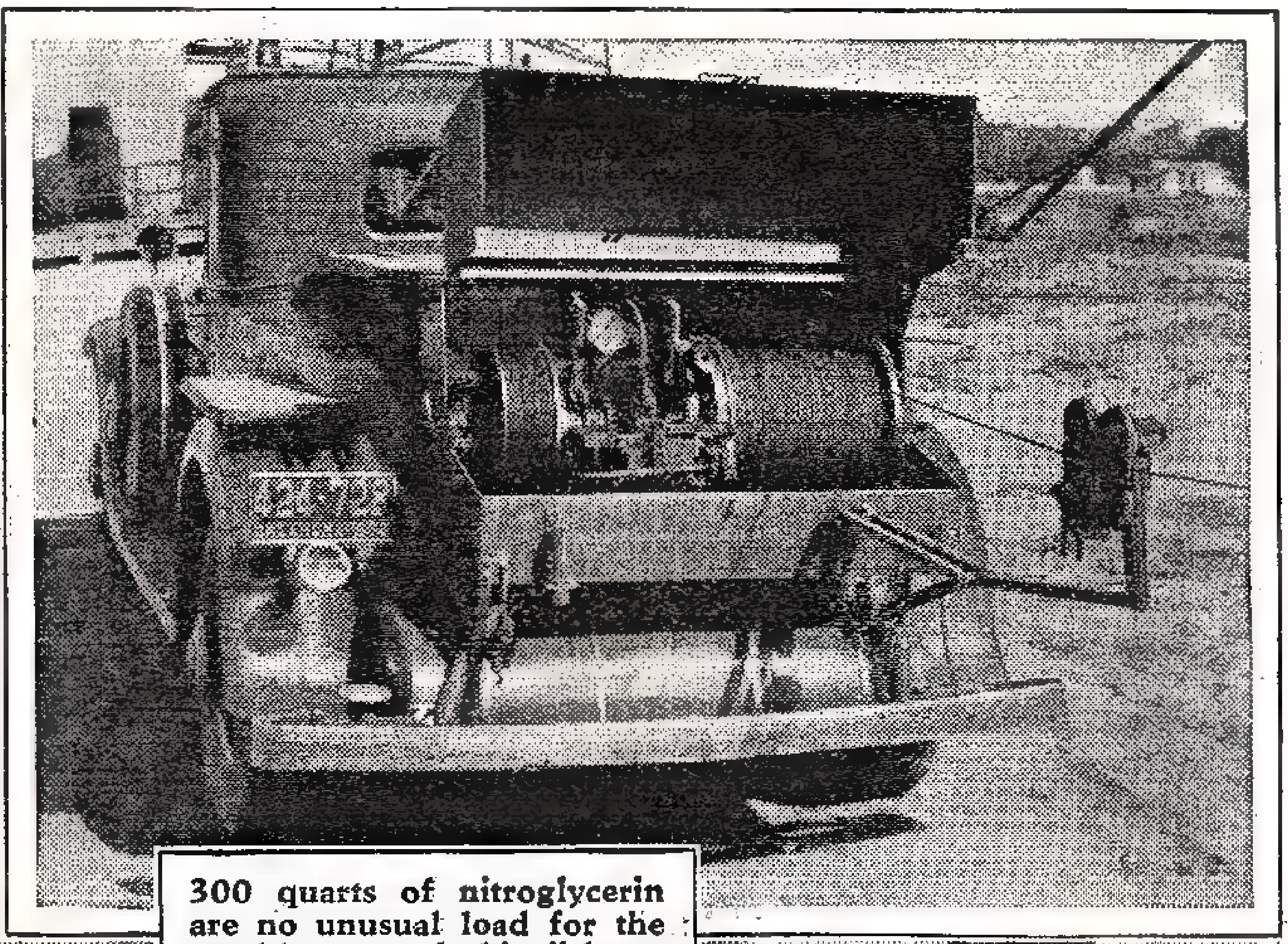
The robot delivers the same stroke in series, or alters its shots, placing them in various parts of the court, at the option of the operator.



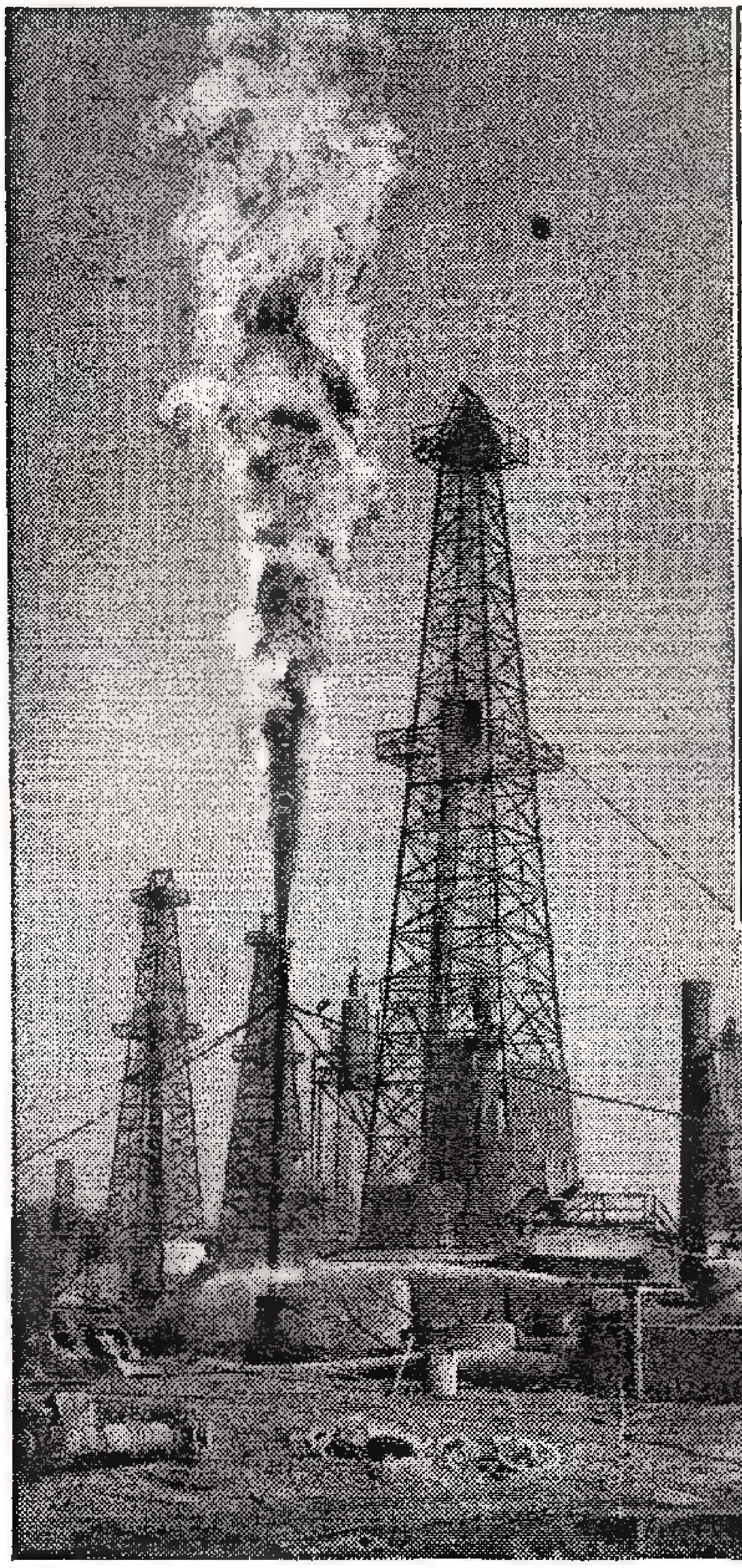
Inventor points out the delivery and striking mechanism.

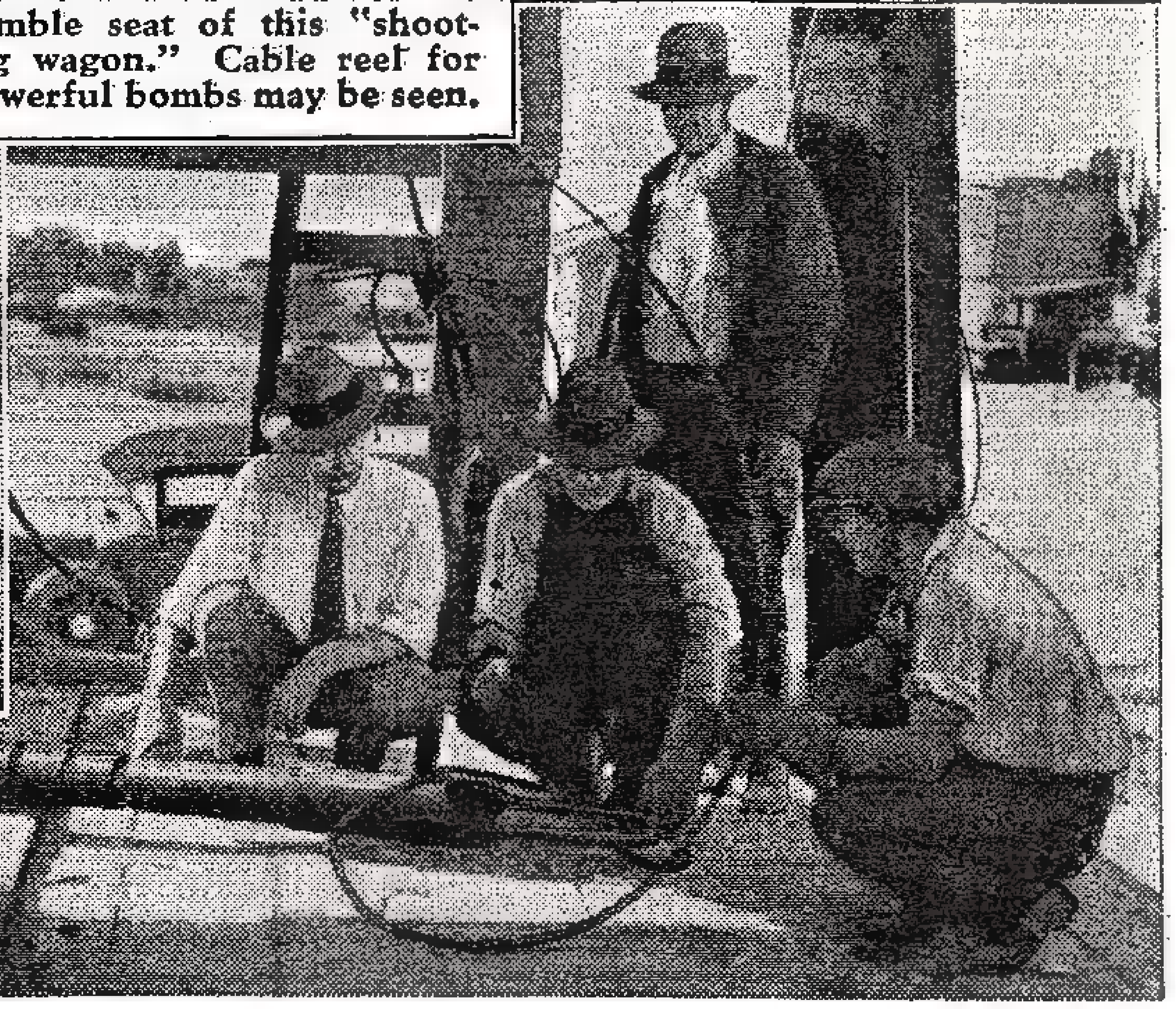
In addition to providing invaluable volleying practice, the machine has an attachment within its frame which renovates old balls by a re-napping process. This ingenious device whitens the balls and brushes out the fuzz, saving the expense of constantly buying new stock.

Death Rides Rumble Seat of Oil Bomber



300 quarts of nitroglycerin are no unusual load for the rumble seat of this "shooting wagon." Cable reel for powerful bombs may be seen.





Oil well shooting with nitroglycerin, most dangerous explosive in world, brings in gushers like that shown above. After underground explosion, column of dirty water shoots up through top of derrick—then oil, if shot is success. At right: Setting timing mechanism used to explode charge at bottom of well.

A COUPE with trim steel compartment replacing the rumble seat comes to a careful stop just a few feet from the towering derrick. The driver, with prematurely-aged face, relaxes as he steps out, for 300 quarts of that deadliest of explosives, nitroglycerin, is not a pleasant load for the rough oil field roads.

Warren G. Bleeker, world's foremost maker of time bombs for oil well shooting, is a familiar figure about the oil fields of this country. His "shooting wagon," with its cable reel in back and its load of "soup" has brought new life to many a sickly oil well.

His is perhaps the most dangerous occupation in the world. There are no injuries; the shooter is either alive—or dead.

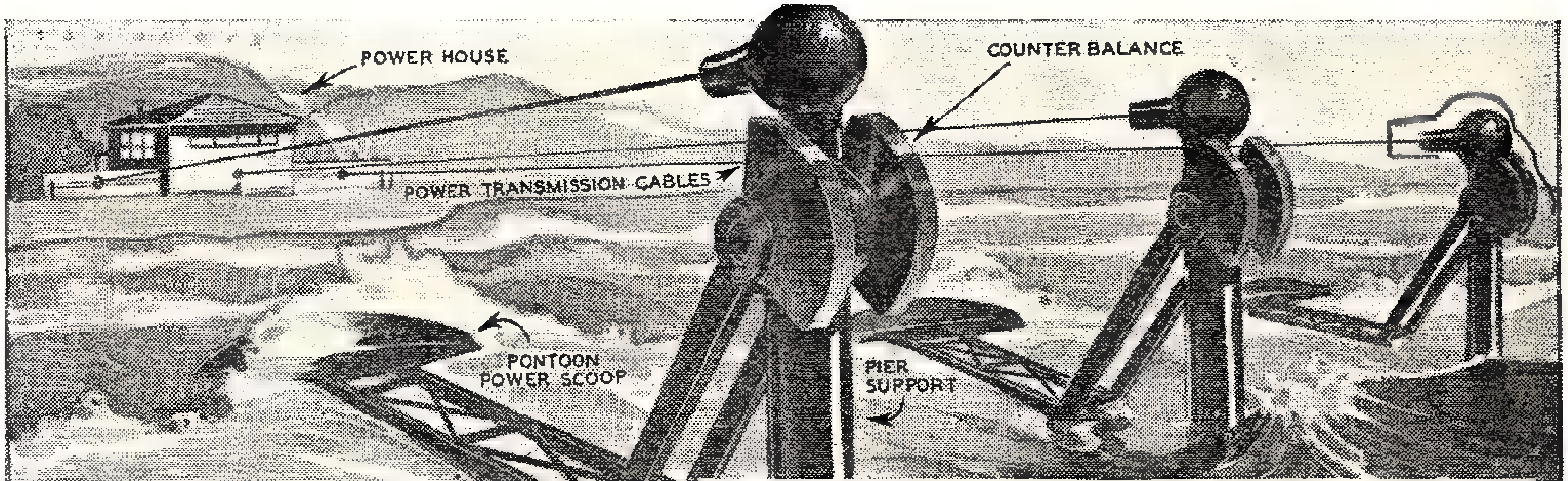
When a well is being shot, there are few onlookers. The yellowish, oily liquid must be poured from the 10-quart metal and rubber containers into long iron cans. There must be no gurgling, no splashing!

The charge resting at the bottom of the well must be set off with a dynamite bomb.

A few years ago, in an eastern field, a bomb set for one hour stuck in the casing. The shooter worked frantically to free it. The superintendent told him to let it blow up as the time grew short. He kept working, finally freed it, yanked it to the surface, and carried it away from the well. Two minutes later the bomb exploded . . . his escape was a miracle.

The explosion of 300 quarts of nitroglycerin 4,000 feet underground can not even be heard, but the results are very evident, if the shot is a success. With a loud "whoosh!" a column of dirty water and oil shoots up to the top of the derrick. A mist of oil sprays the ground. Men run to cap the gusher. On all faces are smiles. The well has come in . . .

Batteries of Robots Scoop Power From Sea With Shovels

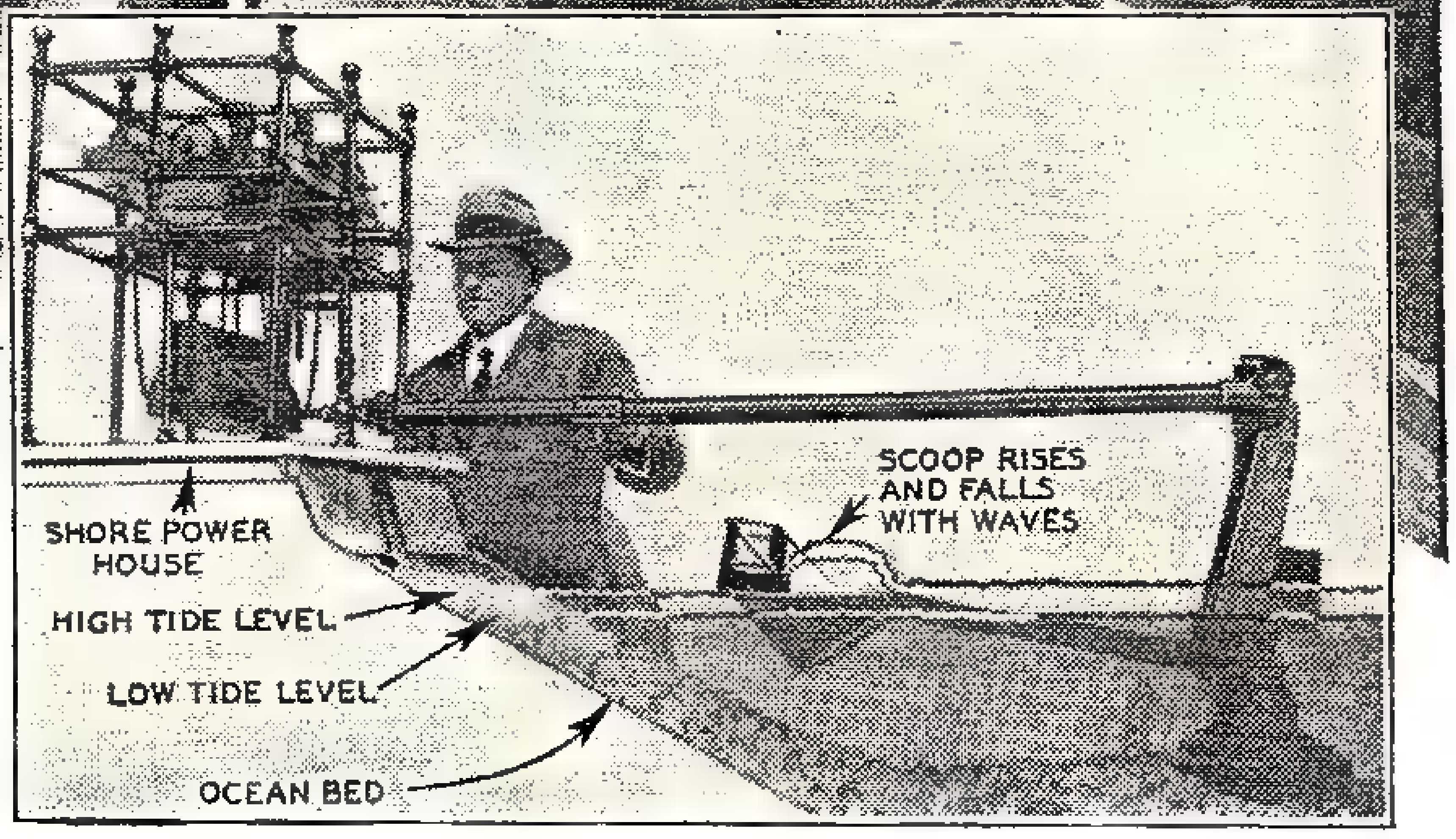


Artist's impression of a battery of wave motors scooping power from sea to turn dynamos which feed power to shore station.

A ROBOT wave motor designed to use the tremendous unharnessed power of waves at sea for generating electric power at low cost has been invented by Chester E. Shuler of Los Angeles.

Robot-like machines built in the sea on concrete foundations have huge metal shovel arms which are lifted upward by onrushing waves. The counter-balanced arms drive electric dynamos through speed-multiplying gears, so that a small movement of the arms spins the generators at high speed. Ratchets permit the shovels to drop down freely as the waves pass on, to be in readiness for following waves.

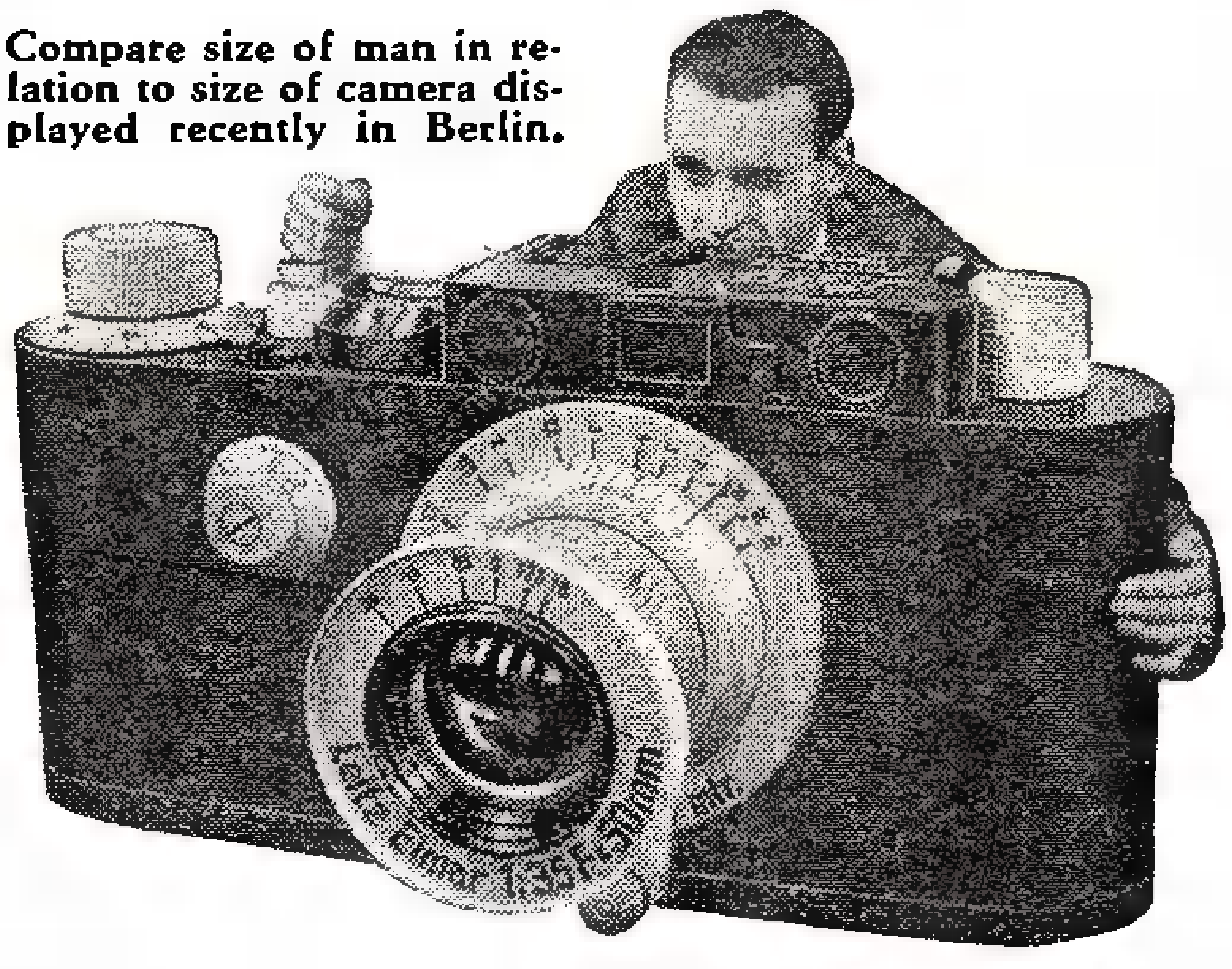
When a battery of these machines are installed to be operated together, the shovel arms are all inter-connected and belted to huge flywheels either on shore or in a powerhouse built in the ocean. Each onrushing wave lifting the shovels would give a new impulse to the flywheels. The dynamos could thus run at almost constant speed.



Working model of the Shuler wave motor. Shovel floating on water surface is lifted up by onrushing waves. Movement of arm is here transmitted to shore to turn generators.

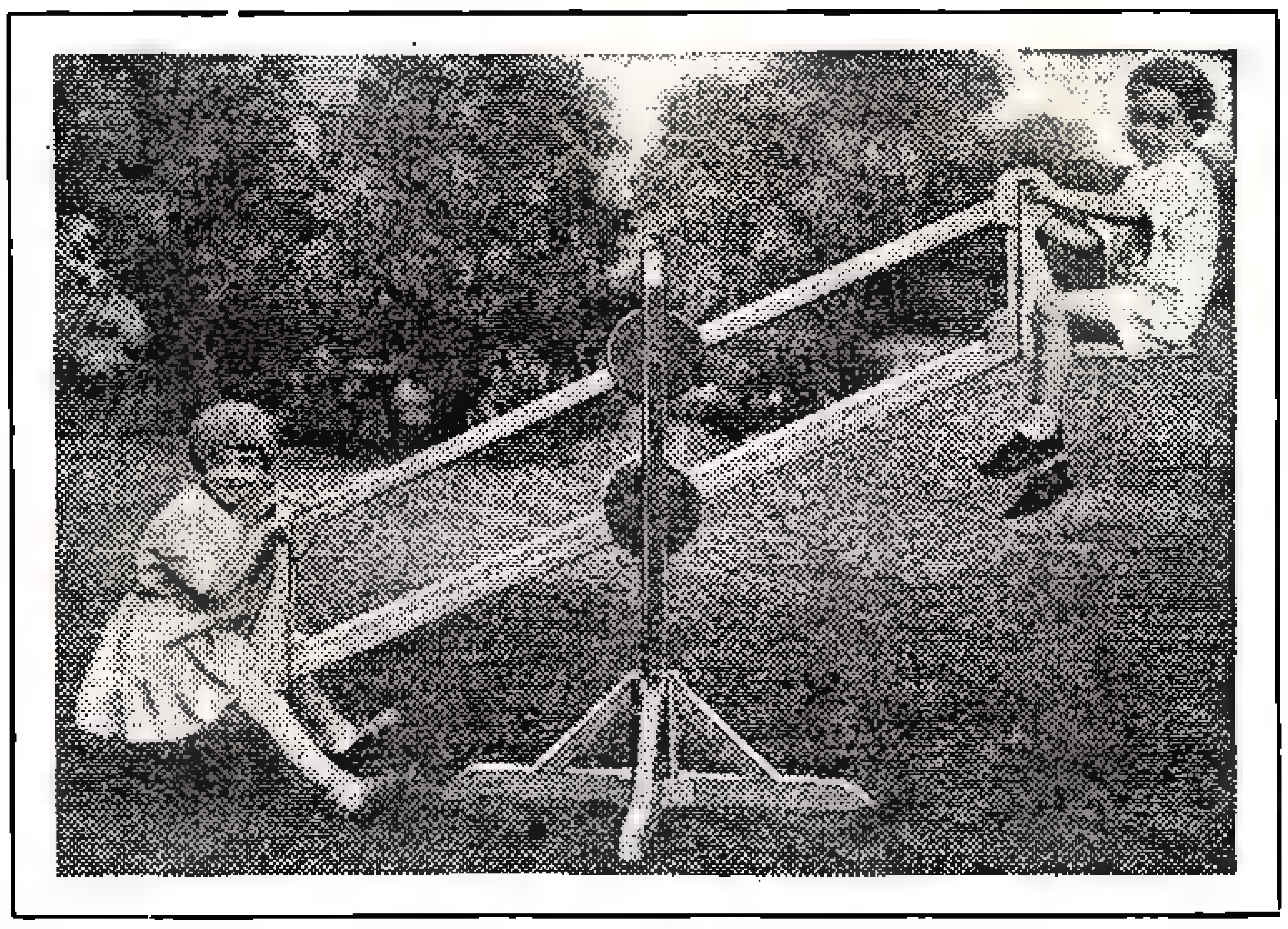
Camera Nearly as Large as Man

Compare size of man in relation to size of camera displayed recently in Berlin.



ONE of the amazing displays at the recent camera exposition held in Berlin was that of a camera almost the size of a man.

This camera was complete in every detail and was fully capable of taking pictures.

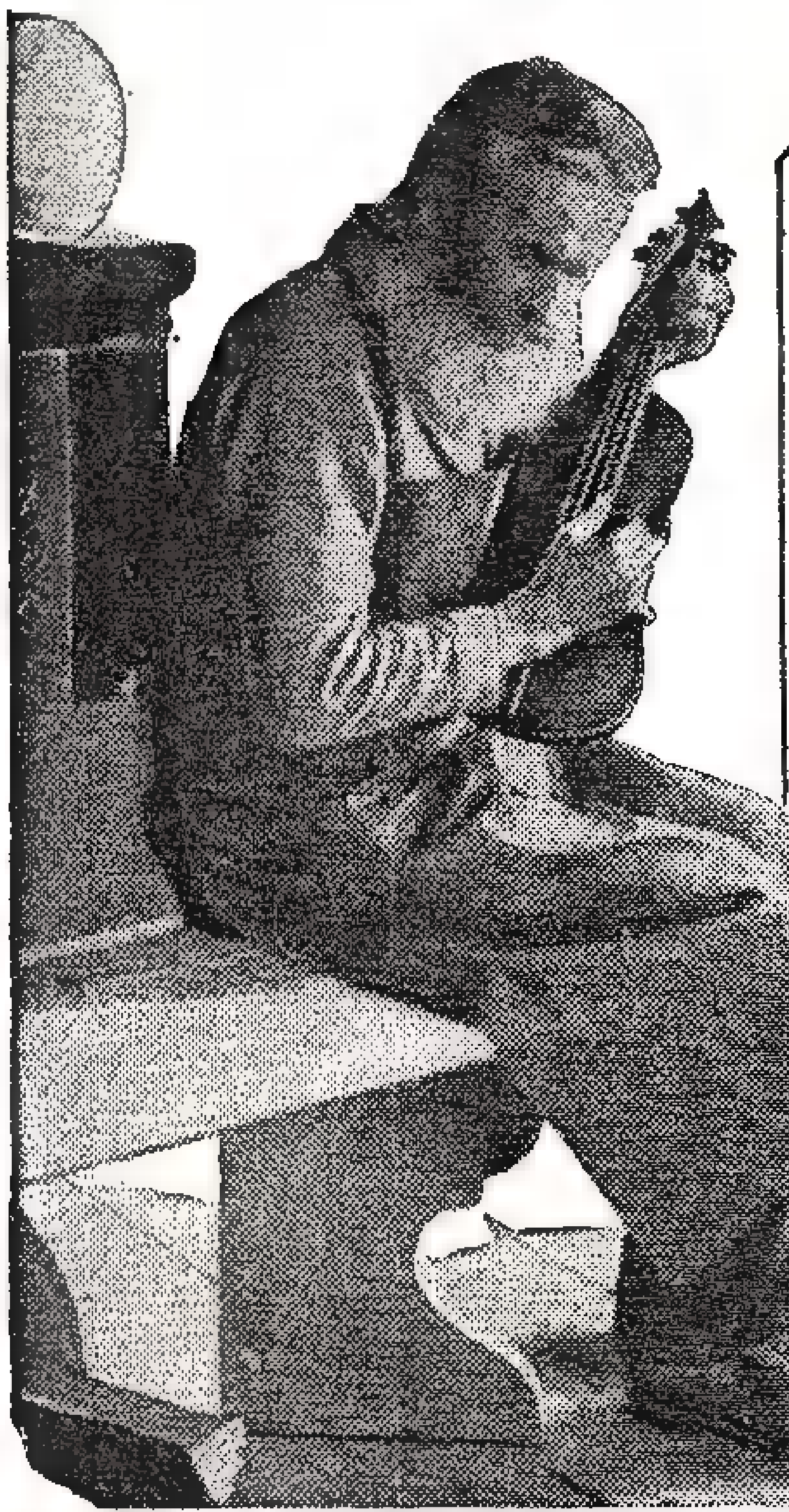


Something new for children. It is called the aero-teeter, because it goes up and down and around, providing something of a sensation of riding a long ocean swell near shore.

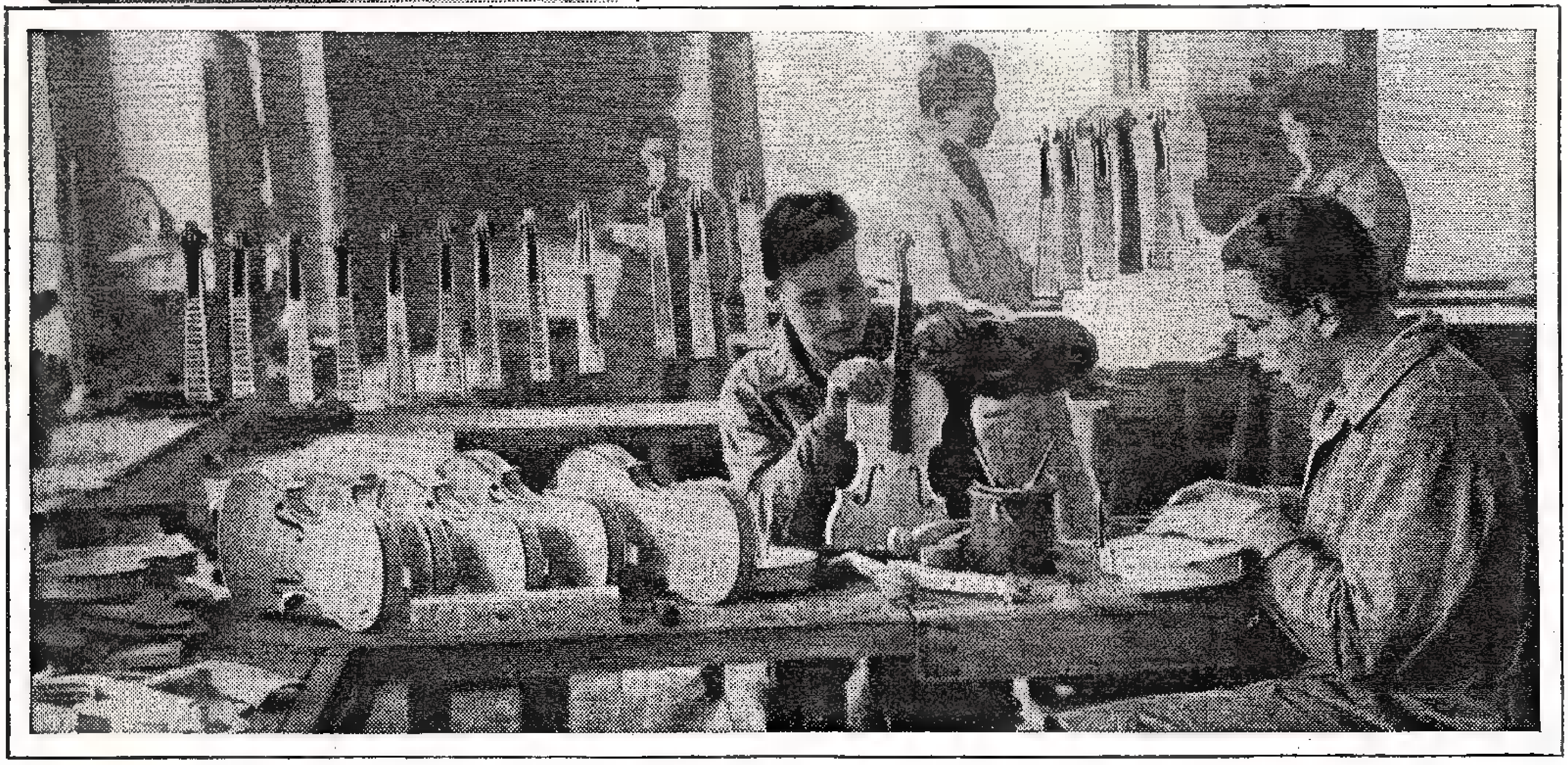
Merry-go-Round, Teeter Combined

AN INTERESTING development of the old time teeter-totter is seen in the aero-teeter, that may be worked up and down in the usual way, or round and round as a merry-go-round. By combining these two motions, the result is a ride like the "ocean-wave."

Build VIOLINS Before Learning to Play



Almost every young male inhabitant of Mittenwald, in the Bavarian Alps, is an accomplished musician. Above picture shows a village orchestra in rehearsal. Left is an aged Mittenwald violin expert.



Here is the start of a Mittenwald musical education. Young men build their own instruments. When they have learned why and how a violin produces music, they are ready to undertake task of mastering the art of playing it.

MITTENWALD, picturesque village in the Bavarian Alps, may be old fashioned in its beliefs, yet it points with pride to the fact that almost every male inhabitant of the place can play the violin, cello, mandolin, zither, guitar and viola.

And before a young man learns to play the violin, which is the instrument about which knowledge of the others is centered, he must first know how to make one.

For Mittenwald is the home of the violin. Back in 1684, when America was still a land of wild Indians and brave pioneers, Matthias Klotz, a native of Mittenwald, went afar to learn the art of violin making from Italian and Tyrolese masters. He returned years later and founded an industry now the principal activity of the village.

Klotz fostered the doctrine that before a man can really play a violin and take from it the best of its beautiful music, he must first learn just why and how the instrument produces that music. As a consequence, Mittenwald has produced not only a group of skilled violin-makers, but also a community of soul stirring music masters.

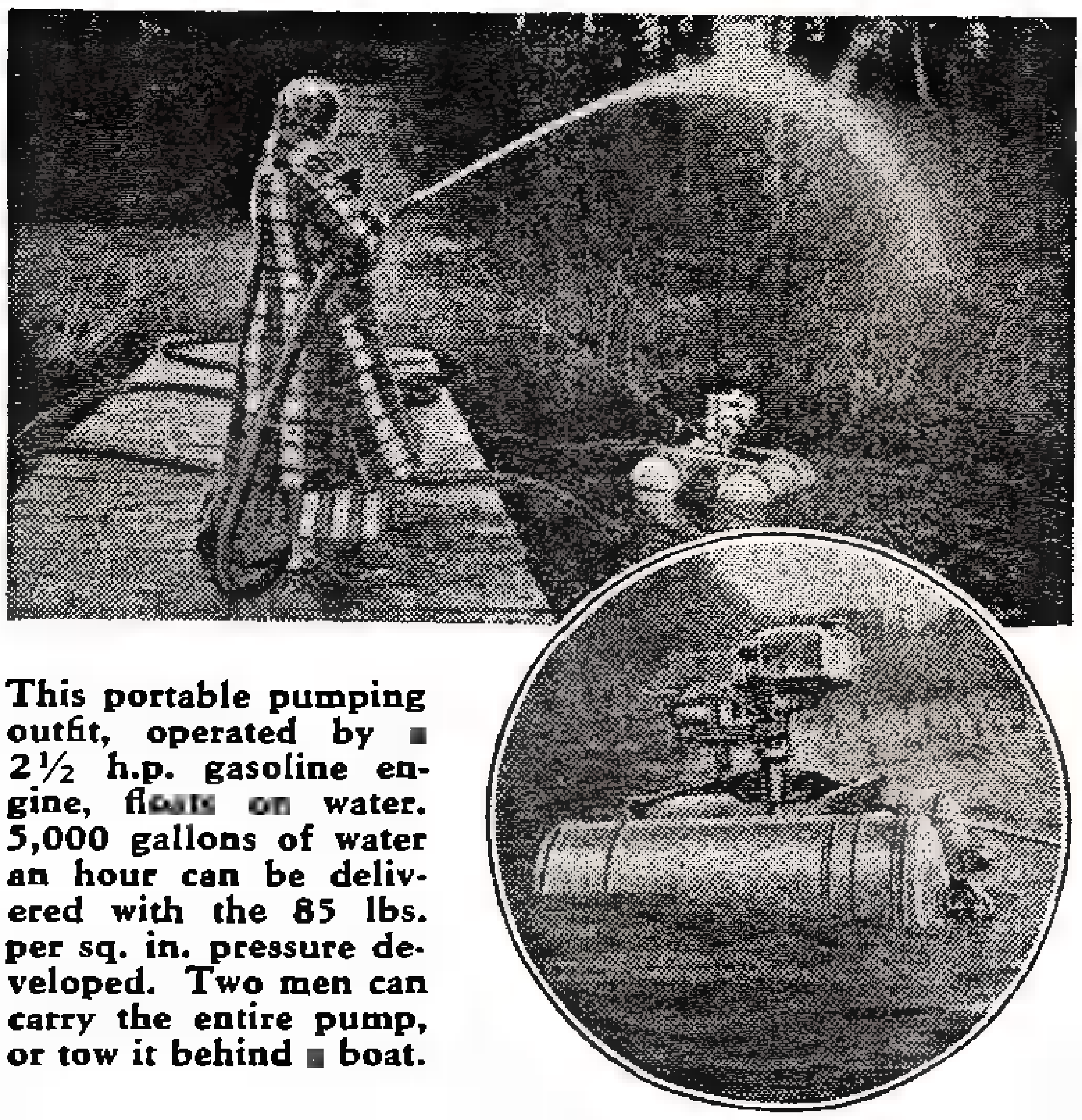
Youths of the village look forward to the possibility of attaining musical prominence.

While many who have mastered the arts of violin making and playing go forth into the world to achieve fame and fortune, many others stay on to teach new generations the arts which have so long distinguished Mittenwald.

Midget Floating Pump Delivers 5,000 Gallons an Hour

AN INTERESTING German invention is a floating water pumping installation which rests on pontoons, and can be moved around to different points along the shores of lakes or streams. Only a hose or pipe line need be run from pump to shore.

A 2½ horsepower engine drives the tiny pump for nearly three hours on one gallon of gasoline. With its maximum pressure of 85 pounds per square inch it is possible to pump about 5,000 gallons of water an hour. Two men can easily carry the entire outfit.



This portable pumping outfit, operated by a 2½ h.p. gasoline engine, floats on water. 5,000 gallons of water an hour can be delivered with the 85 lbs. per sq. in. pressure developed. Two men can carry the entire pump, or tow it behind a boat.

New Lamp Bulb Has No Filaments

Katherine Heinrich inspects new filamentless bulb, which reduces light bills 60%. Inner glass tube has mercury vapor.

ONE of the most radical of recent electrical developments is the filamentless lamp. Tests have proven that this new bulb would save almost 60% in power costs.

The lamp consists of two cylindrical bulbs one within the other, with the space between the two evacuated. The inner tube, filled with mercury vapor, has two electrodes. The bulb is cold at all times since the glow discharge gives off no heat.

New Rays Found in Stratosphere

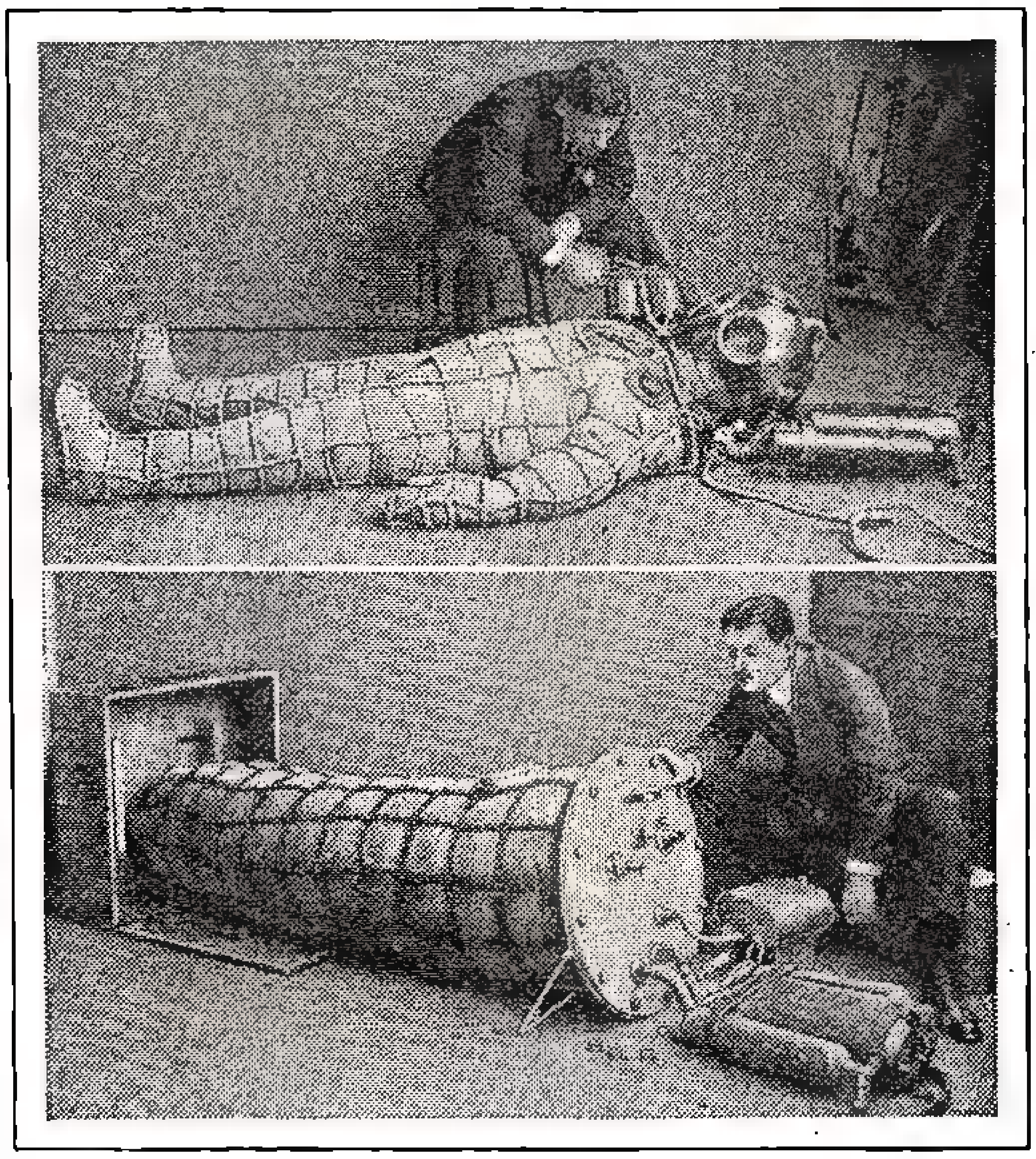
AFTER studying readings of instruments carried by Settle and Fordney on their 11½-mile stratosphere ascent last fall, scientists announce the discovery of a new cosmic ray, originating far outside the earth's atmosphere.

This ascent also settled a long dispute as to nature of cosmic rays.

Pressure Sack Saves Divers' Lives

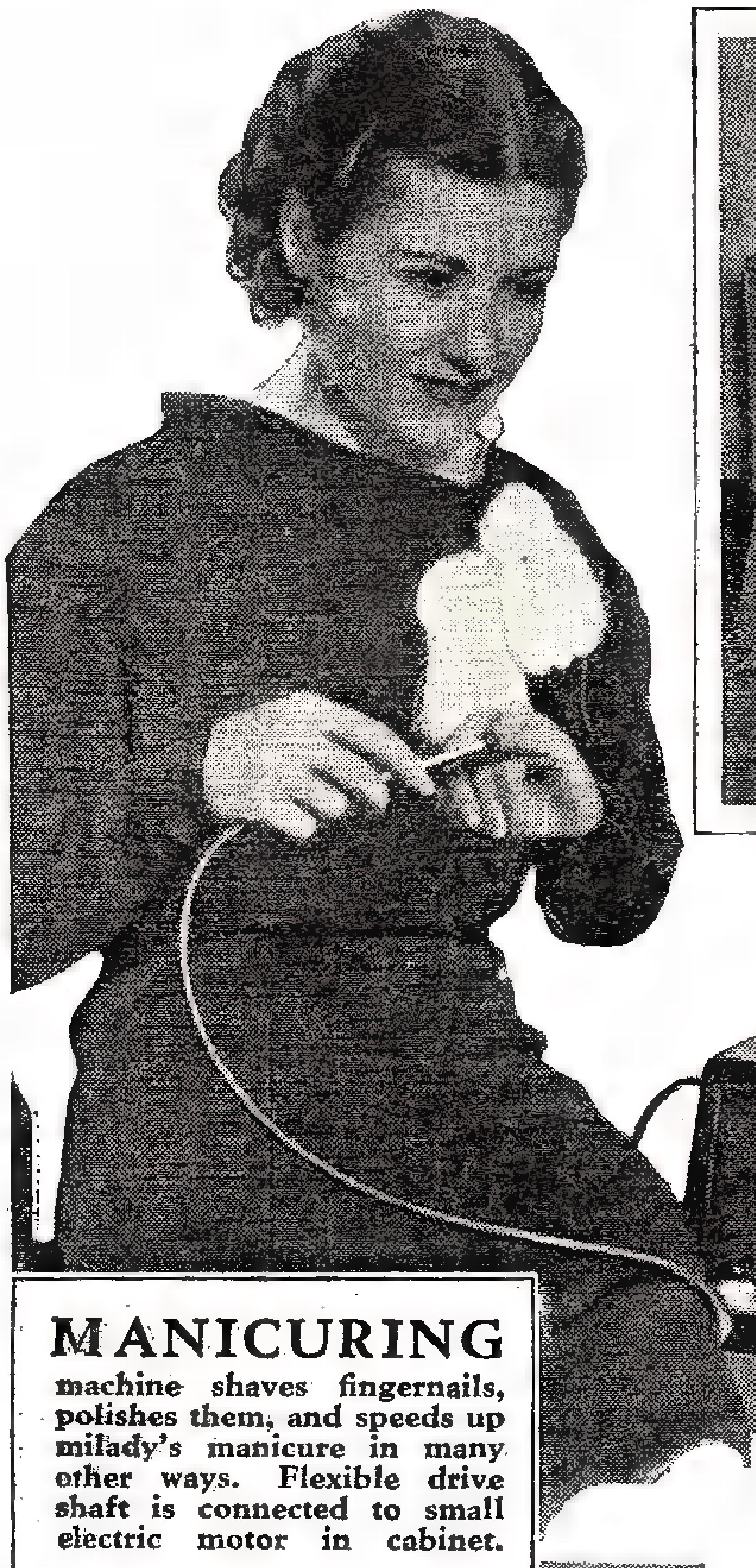
WHEN deep sea divers must be pulled up rapidly, without time to accustom themselves to the change in pressure, they become very sick. A German inventor has devised a pressure sack for this emergency. Divers are placed inside it as soon as they are pulled up, and kept under a gradually diminishing pressure for several hours. Iron chains surround the sack.

When there is not sufficient time to get a diver into the pressure sack, compressed air can be forced into his suit. Ropes are used to prevent suit from bursting.

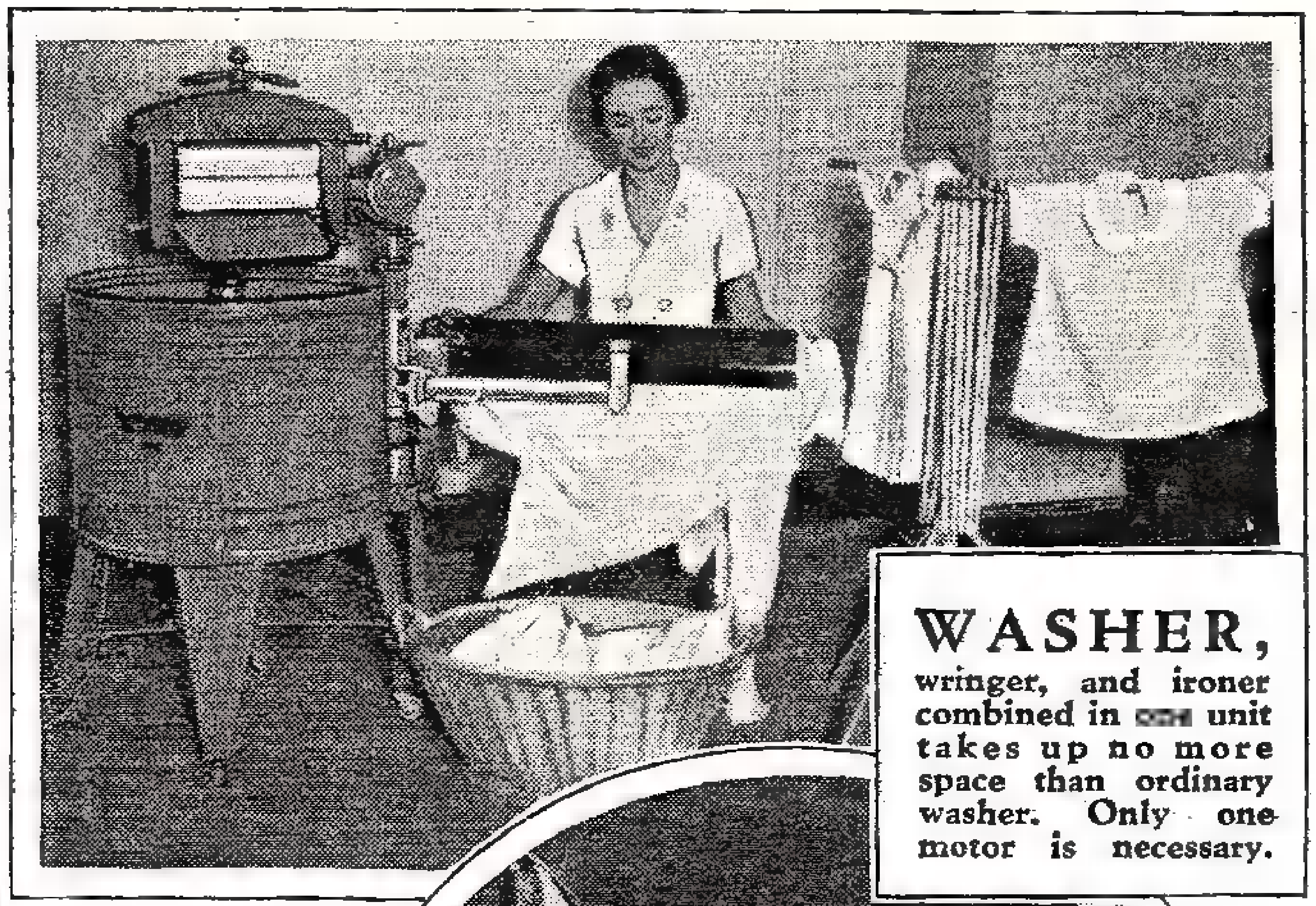


Above: Compressed air apparatus directly connected to suit of diver pulled up hurriedly from ocean's depths. Below: New pressure sack, inside which diver is placed a few hours.

Robot Manicurist Among New Home Aids

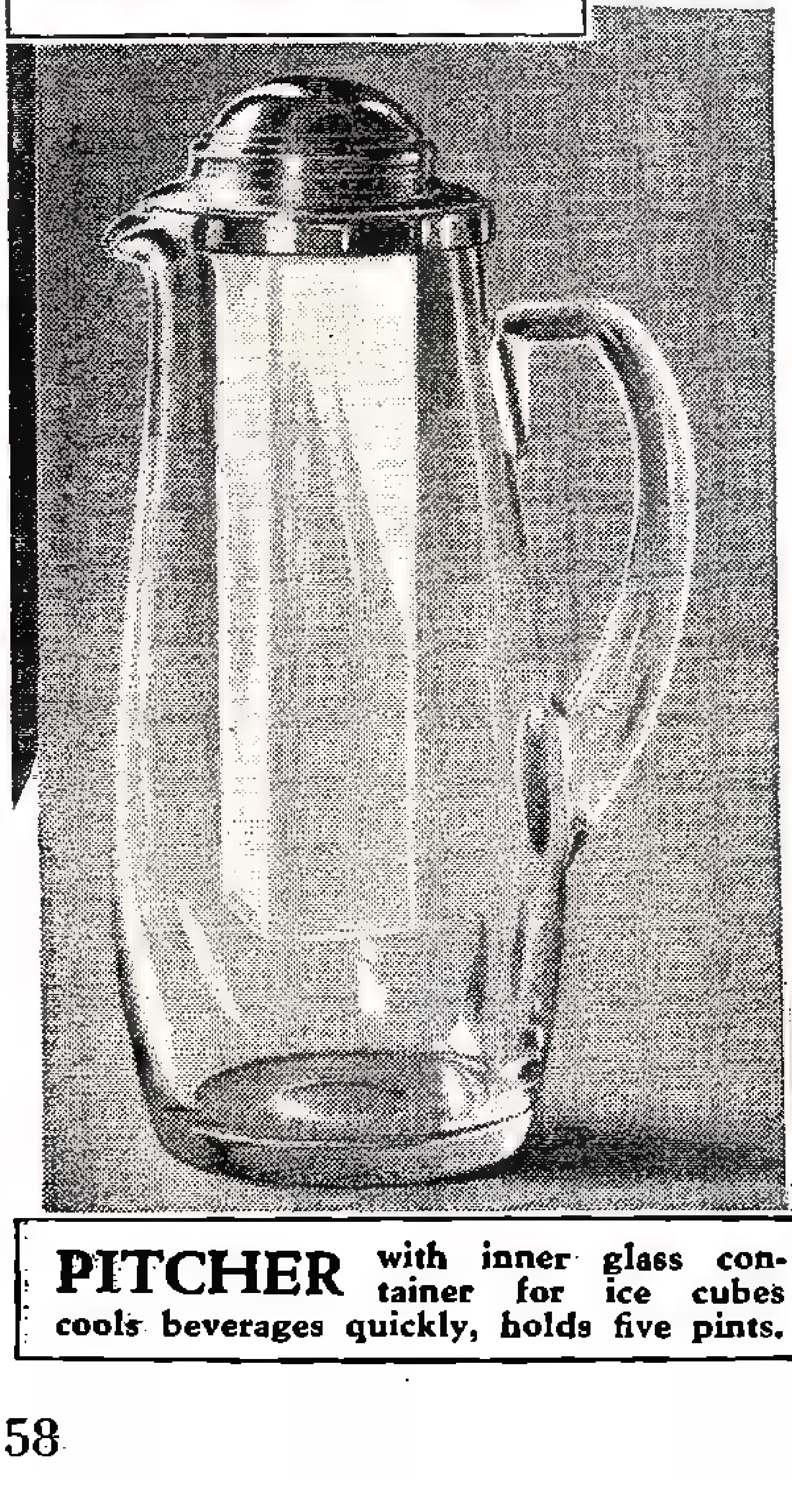


MANICURING machine shaves fingernails, polishes them, and speeds up milady's manicure in many other ways. Flexible drive shaft is connected to small electric motor in cabinet.



WASHER, wringer, and ironer combined in one unit takes up no more space than ordinary washer. Only one motor is necessary.

INITIALS which can be ironed onto any cloth material, and will withstand laundering, are now available.



PITCHER with inner glass container for ice cubes cools beverages quickly, holds five pints.

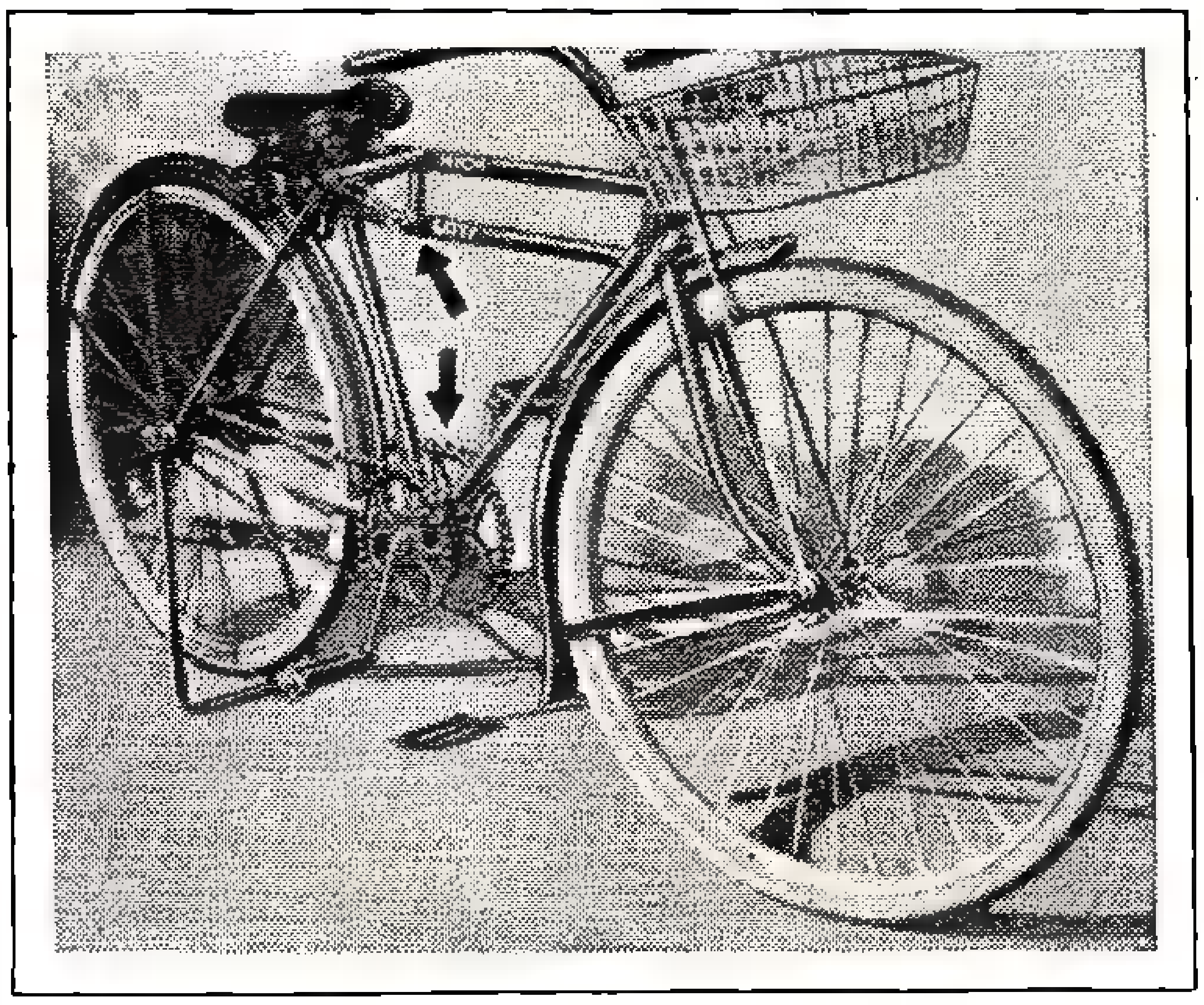
PEELER resembling hand power lathe pares potatoes, apples, and other vegetables uniformly, shaving off very thin layer. Potato is peeled quickly by turning handle.

Bicycle Gearshift Makes Hill Climbing Easy for Cyclists

CYCLISTS no longer have to jump off and push their wheels up the steeper hills, now that a bicycle gearshift is available.

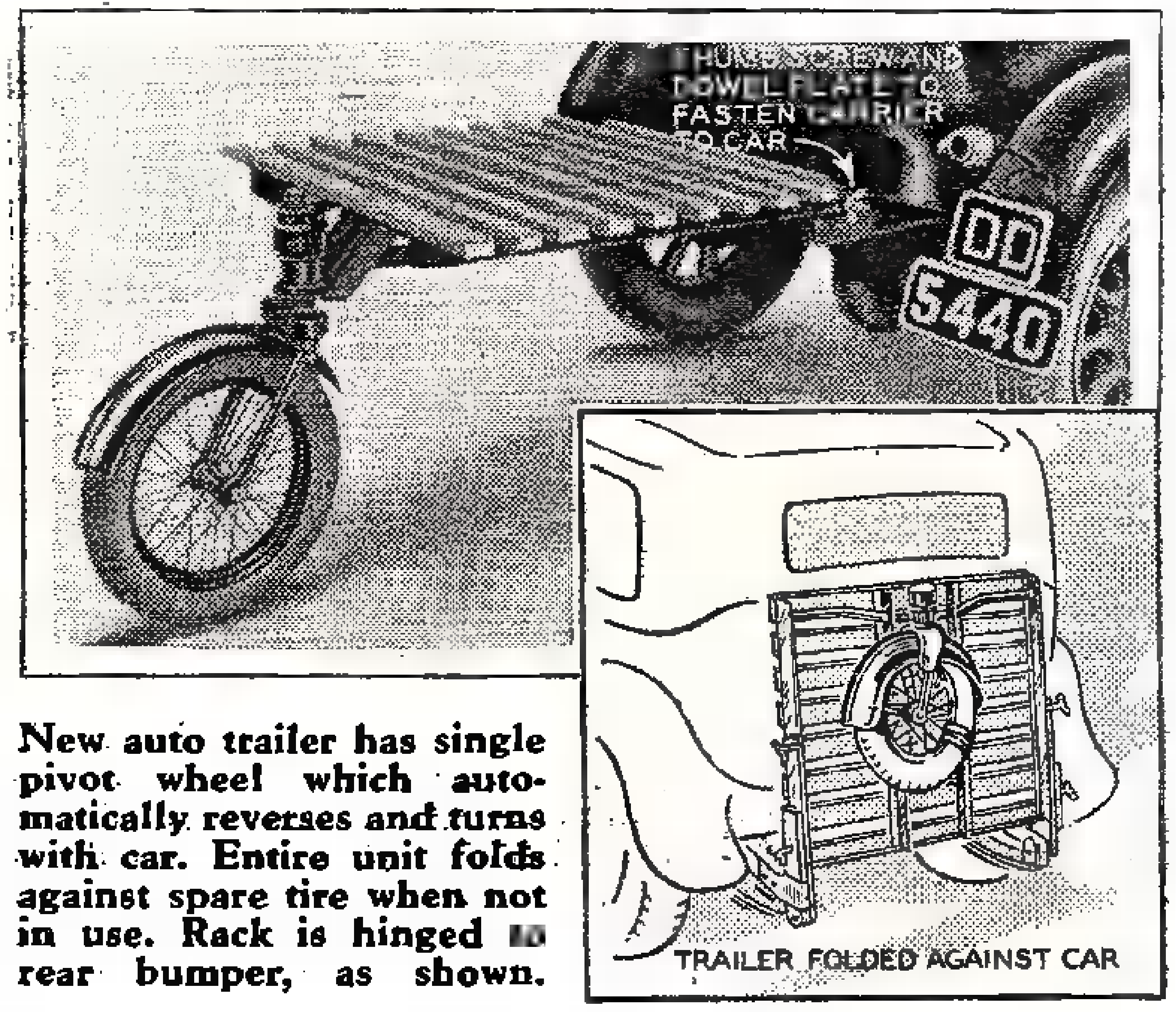
The high gear is used for normal riding; the rider has but to shift to low gear, and ride up the steepest of grades in comfort. The coaster brake functions as usual with both gears.

In one type the gear selection is controlled by a lever on the frame; in the other the shifting is done by a foot-controlled lever on the pedal crank.



On this bicycle gear shift lever is attached to frame near seat. High speed gears are for ordinary riding; low gears for hills and rough, sandy ground. Gears fit any bicycle.

One-wheel Trailer Folds Up on Car


THUMB SCREW AND DOWEL PLATE TO FASTEN CARRIER TO CAR
DD 5440
TRAILER FOLDED AGAINST CAR

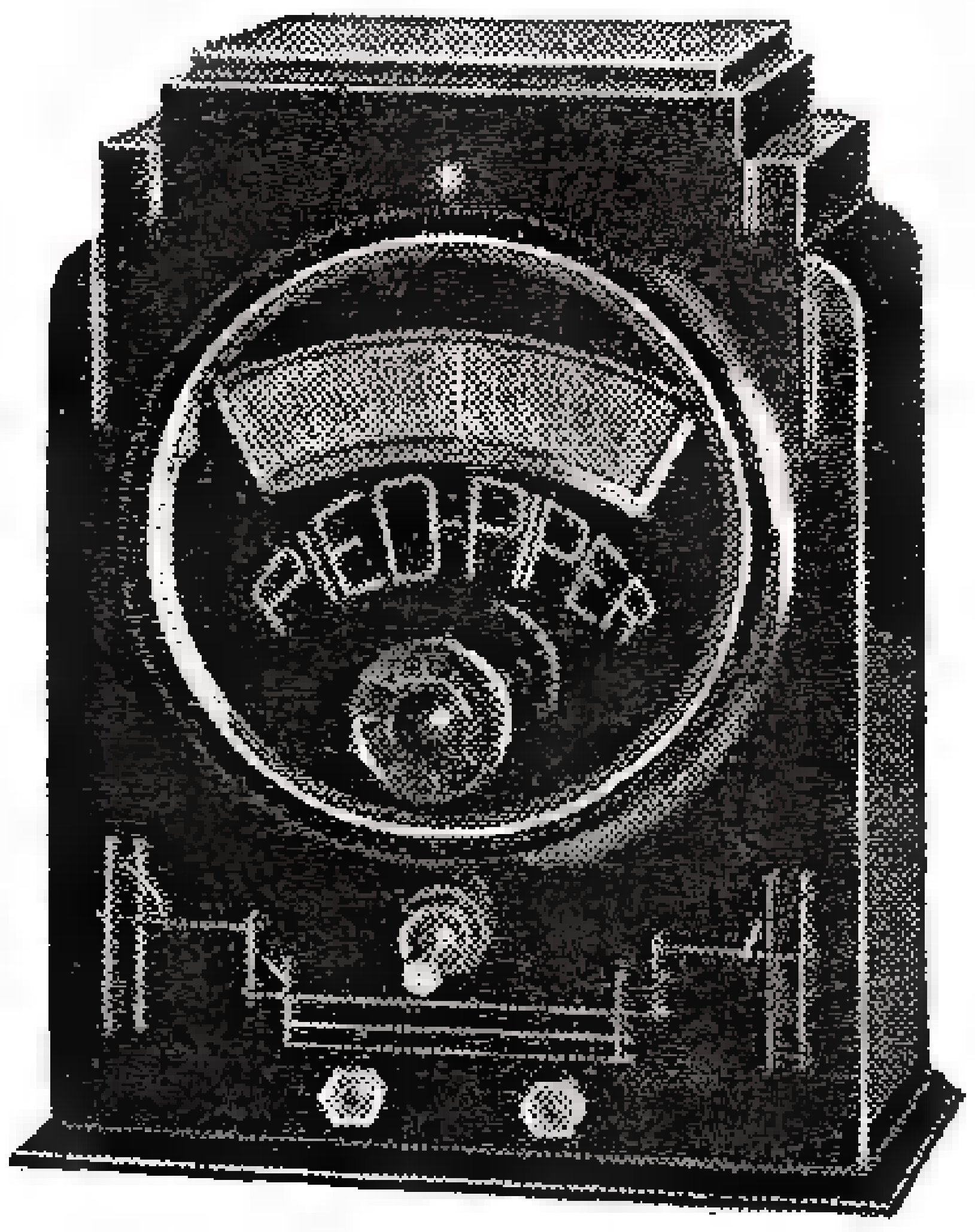
New auto trailer has single pivot wheel which automatically reverses and turns with car. Entire unit folds against spare tire when not in use. Rack is hinged to rear bumper, as shown.

THE latest in trailers, a one-wheel affair that folds up against the spare tire when not in use, is finding great popularity among English motorists.

A single castor wheel automatically reverses or turns with the car. The luggage rack trailer is hinged to rear bumper at two points.

New Crystal Radio Is Powerful

THE latest in crystal sets, housed in a beautiful black bakelite case, has even an illuminated tuning dial. It is claimed that the quality and volume of reception far exceeds that of any other crystal receiver. No batteries are needed—only aerial, ground, and headphones.



Latest in crystal radios, with bakelite case and illuminated dial, gives high quality reception with headphones and great distance.

Eyes Magnify Objects 100 Times

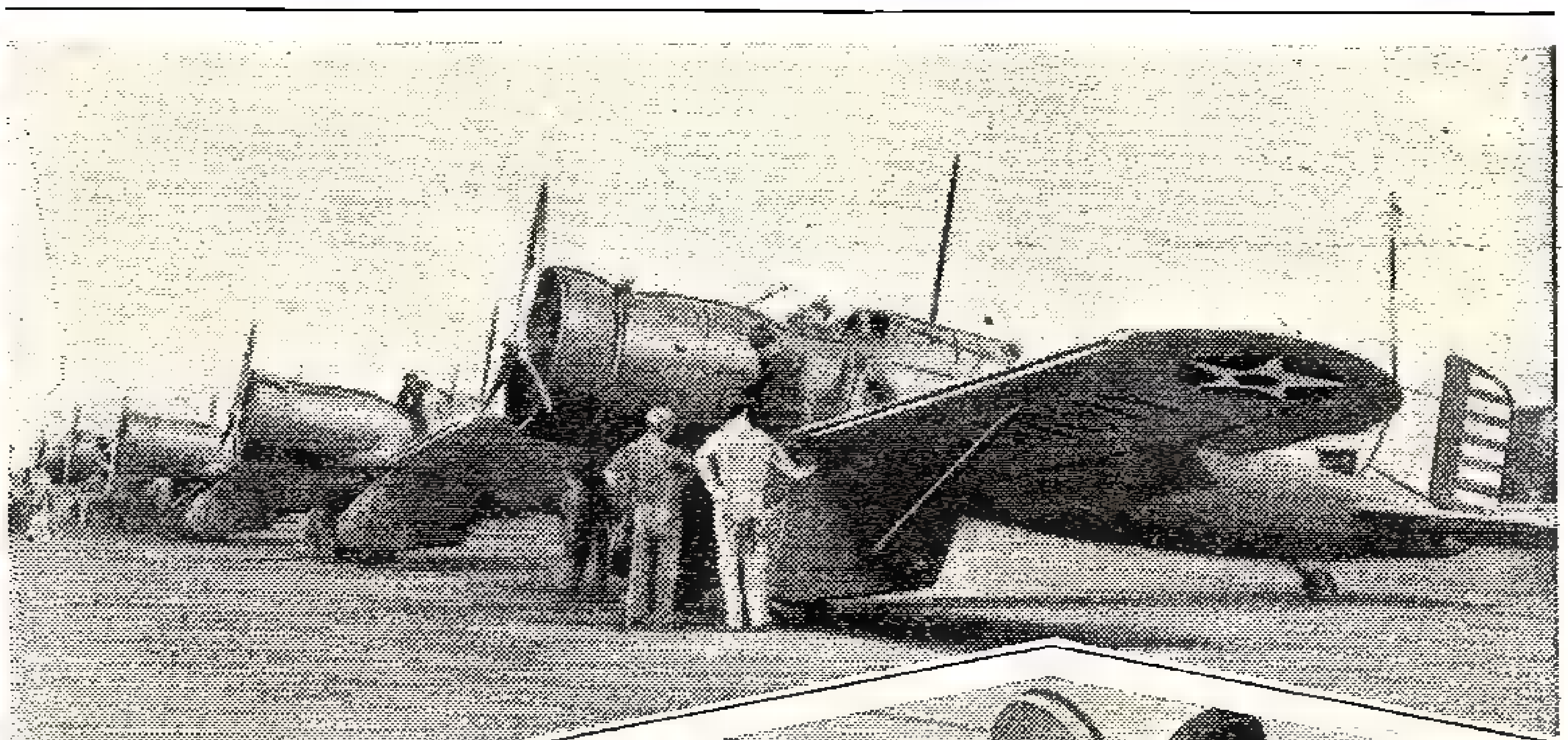
ALVA MASON of Minot, Maine, has eyes which magnify everything within his range of vision one hundred times, making pores appear as deep holes in the skin. He wears demagnifying glasses when at work, since his range of acute vision is limited.

Luncheon Trays for Motorists

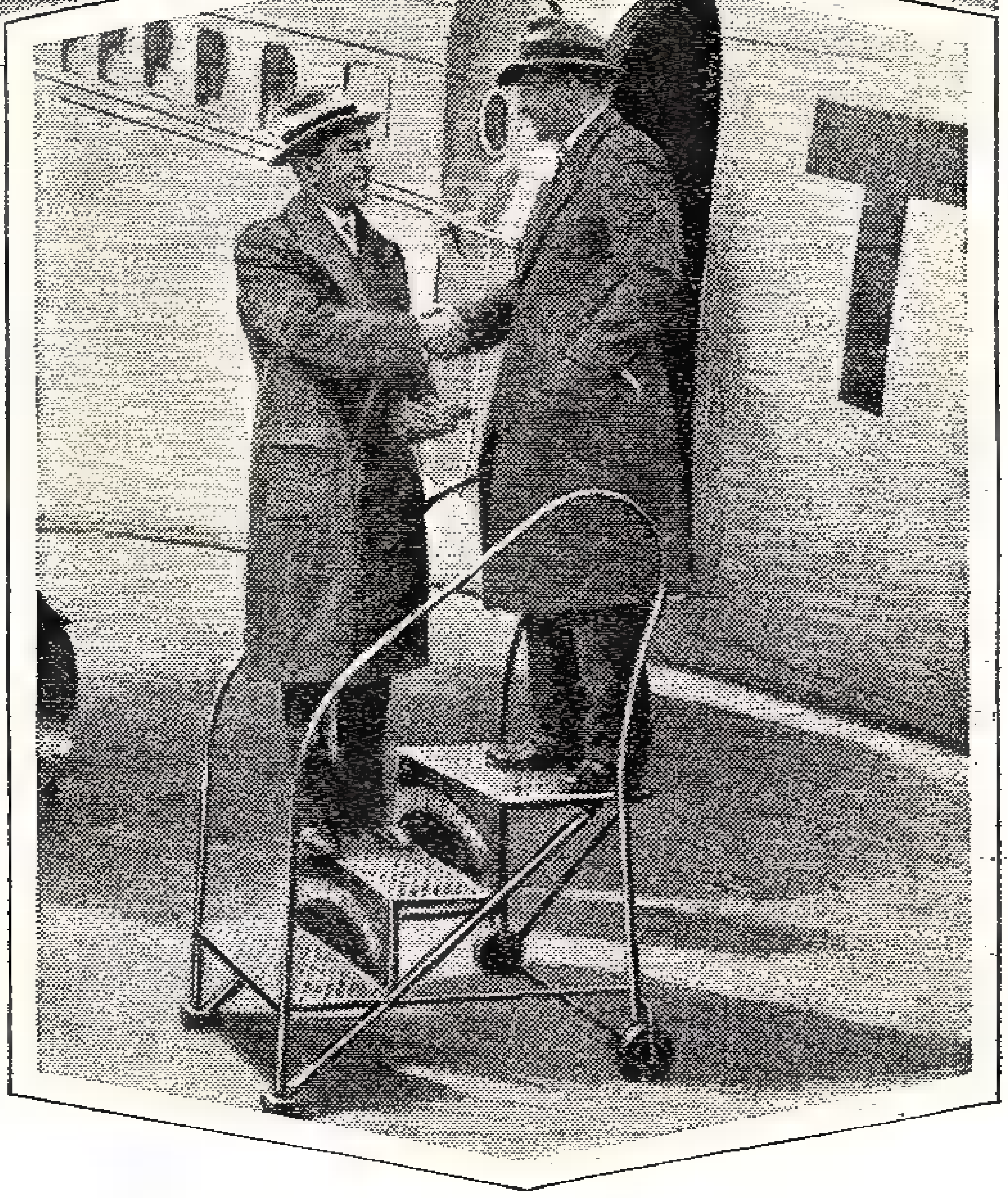
A TRAY which fits inside any closed car permits motorists patronizing curb service stands to enjoy food and drink as if they were sitting at a table. The tray can be instantly leveled by turning a thumb screw. No crumbs need get on the upholstery.

This inside serving tray hooks over the window frame of any closed car, allowing motorists to dine in comfort inside car.

Army Pilots Scorn Danger to Fly Mail



At left — Lieut. Col. H. H. Arnold, feature writer for Modern Mechanix and Inventions, was named head of the army air mail in the West. Above — Army mail ships tuning up



The West-East trans-continental transport record was smashed by Captain Eddie Rickenbacker (left above) in the last private air mail hop. His time was 13 hours.

UNDAUNTED by the hazards of unknown routes and lack of training and equipment for long flights, Army pilots courageously took over the air mail when the government cancelled all private contracts.

The Army tackled the job enthusiastically, even though very few of its pilots had been trained for bad weather flying. Army airplanes did not have the elaborate equipment that practically guaranteed the safety of pilots and planes of the private lines.

Few of the Army men knew the perilous routes over the mountains. They lacked two-way radio to guide them through ice, fog and storms.

Some observers looked upon the government's move as a test of Army aviation. Flying the air mail under all conditions was the greatest peacetime training for Army pilots that could be devised.

Within a week six pilots were killed in comparison with the record of the commercial companies of eight deaths in the whole of 1933.

The record of deaths met with a storm of criticism. Captain Eddie Rickenbacker, who established a West-East transcontinental transport record of 13 hours, four minutes, 20 seconds on the last private air mail flight, called these deaths "legalized murder."

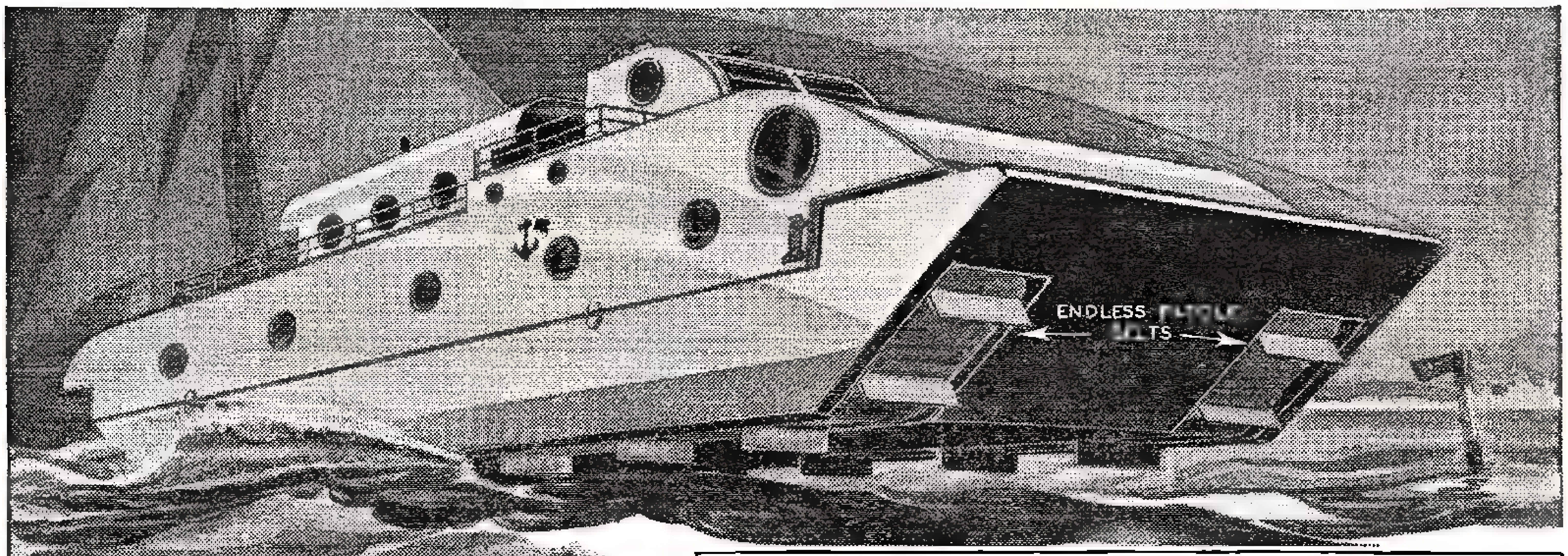
Despite these accidents the mail did go through. The Post Office department swore in 200 officers and 324 enlisted men to fly the mail. In all 148 service ships were revamped for this peacetime emergency.

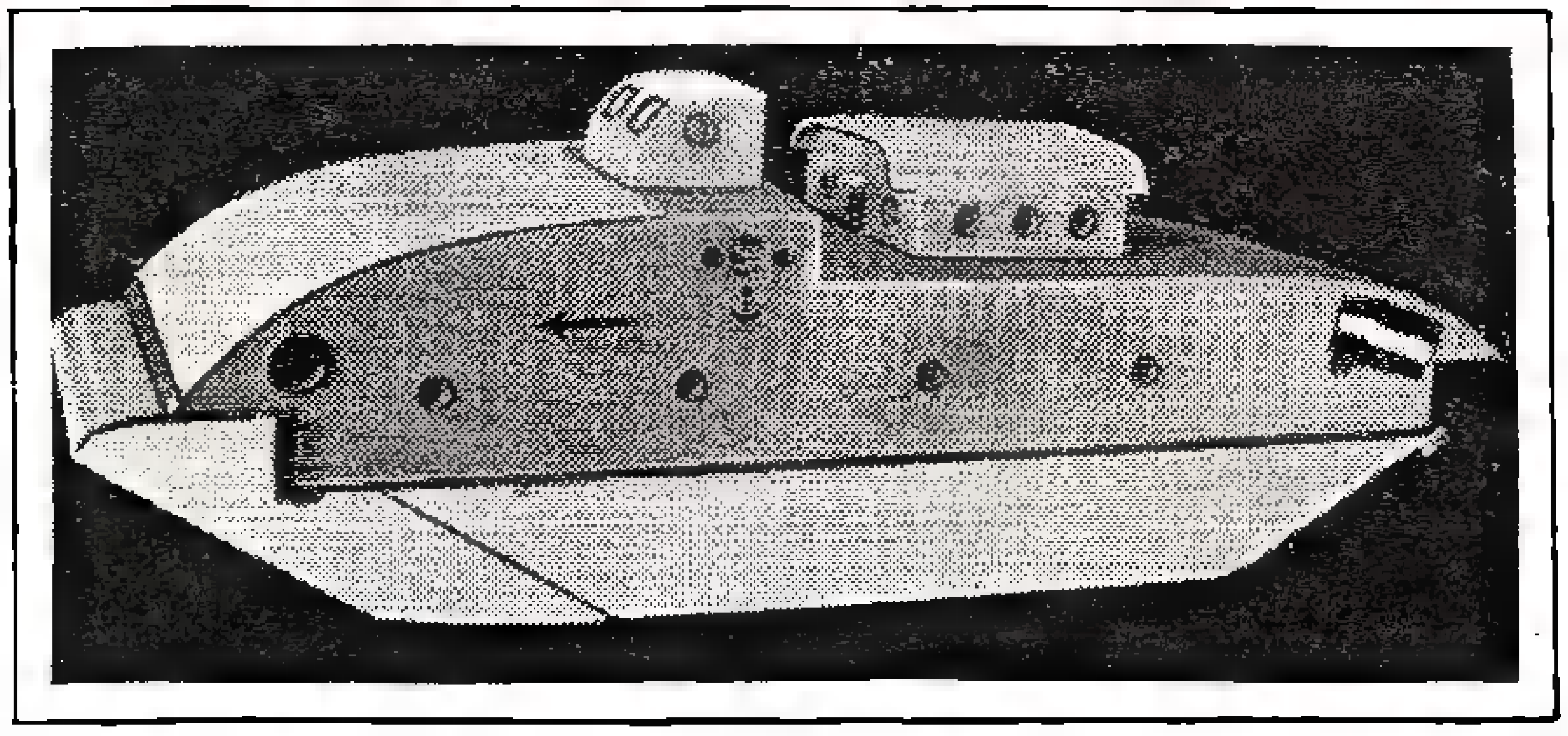
The order cancelling private contracts and turning the air mail over to the Army was the direct result of a congressional investigation which brought out evidence of apparent collusion among private airline officials in bidding for air mail contracts.

President Roosevelt's drastic move was a severe blow to the aviation industry. The wave of protest was led by Col. Charles A. Lindbergh, aviation's ace hero, who in an open letter to the President declared cancellation of the contracts "will unnecessarily and greatly damage all American aviation."

Intrepid Army fliers, however, bravely tackled the task. An organization was set up. In the West Lieut. Col. H. H. Arnold, feature writer for MODERN MECHANIX AND INVENTIONS, was named head of the air mail operations with headquarters in Salt Lake City.

Dutch "Lightning Boat" Has Paddle Belts on the Bottom



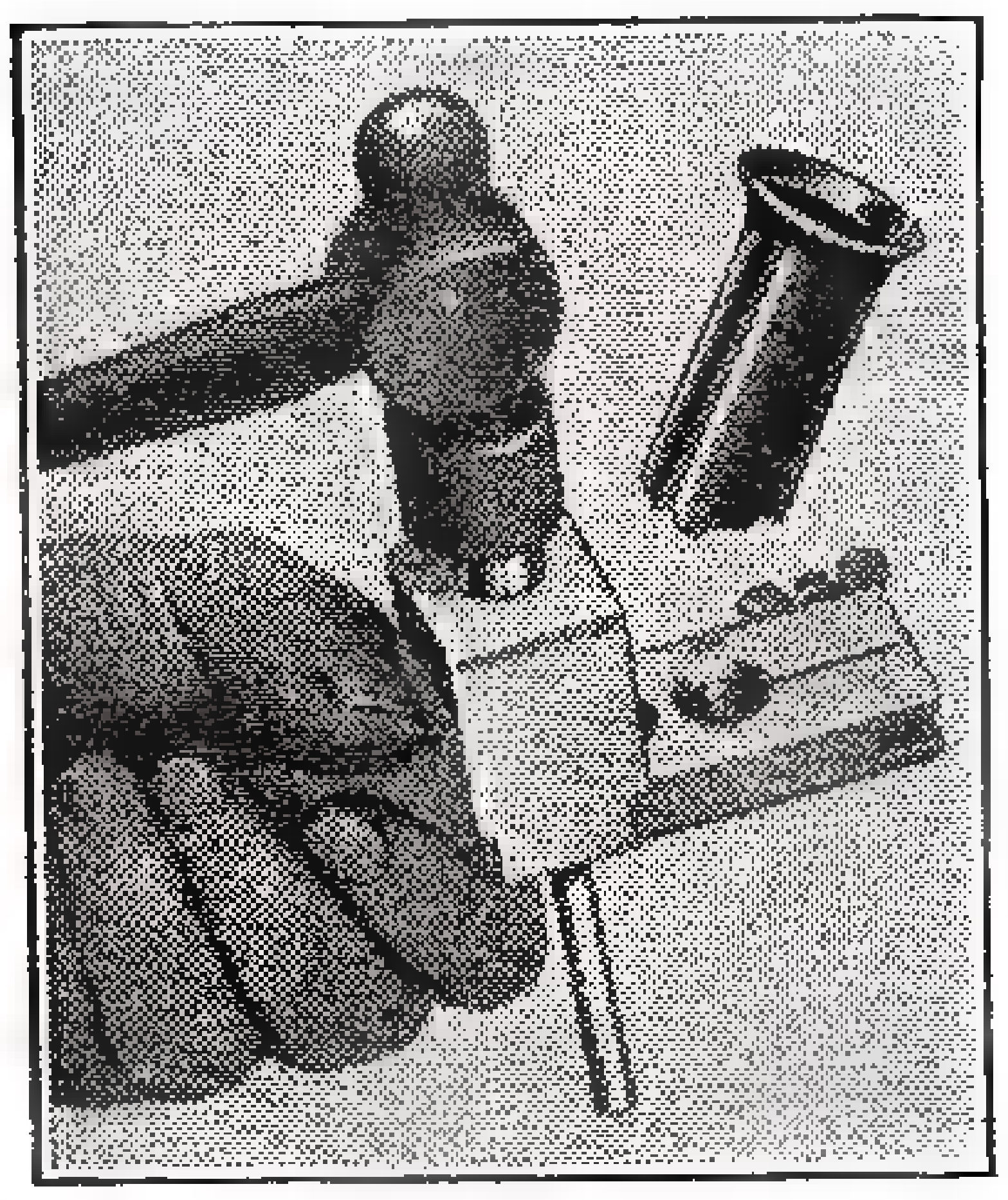


Queer Dutch "Lightning Boat," as pictured above by artist, would cross Atlantic Ocean in 2½ days, according to inventor. Paddles are mounted on two endless belts which travel at high speed across flat-bottomed hull. Chain drive connects each belt to turbines. At right is first model, as made by C. J. Stoete, of Zandvoort, Holland, inventor.

A MODEL of a queer new ocean liner having endless paddle belts which drive it across the waves at speeds of over 60 miles an hour has aroused great interest in Holland. The hull is flat, with endless belts on which paddle blades are mounted running across the bottom at high speed.

The queer paddle arrangement lifts as well as pushes the boat, thereby reducing water friction. The inventor, C. J. Stoete of Zandvoort, Holland, asserts his invention will revolutionize ocean travel.

Hammer Tool Flares Tubing



New tool can form perfect flares on six sizes of copper or brass tubing, 3/16" to ½".

SIX different sizes of brass or copper tubing can be neatly flared with one stroke of a hammer, by using a die and punch assembly recently placed on the market.

Each of the six holes in the tube holder are threaded to grip the tubing without injury. With the tubing gripped in the die, a special punch is slipped into the tube end, and given one sharp blow with a hammer to form a perfect flare. Sizes range from 3/16" to ½".

Cabooses Make College Dormitories

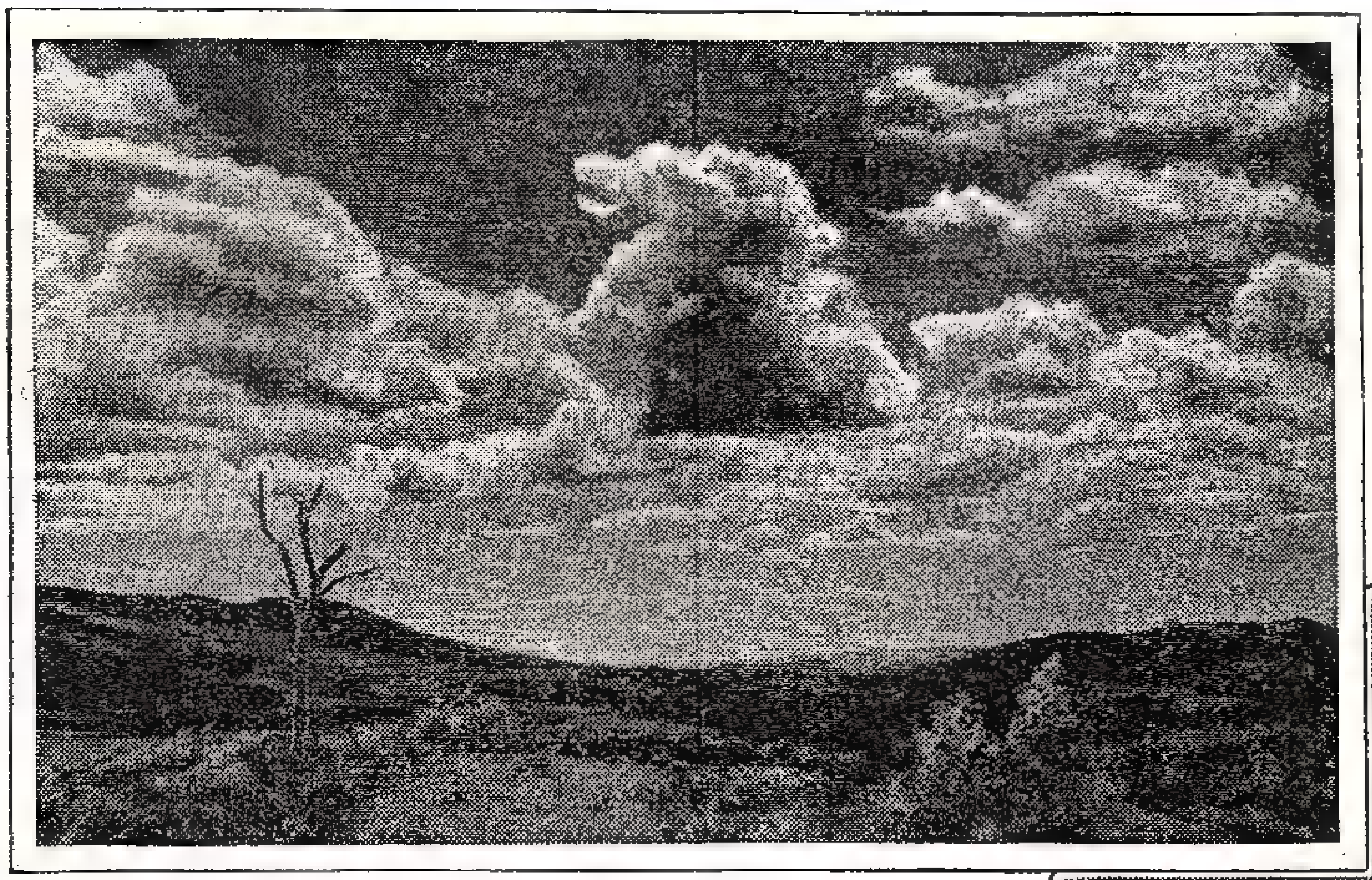
ABANDONED railroad cabooses have been turned into college dormitories by a group of North Dakota University students.

By cooperating on expenses and doing all work themselves they are able to live on $2 per week per man. All meals are served in one caboose.

North Dakota University students live on $2 per week in these abandoned railroad cabooses. Students make own meals and do all work to keep down living expenses.

Study Clouds to FORECAST

Predicting weather is not at all hard if one watches Mother Nature's weather signals. The clouds, the sun, the air, the wind, even the moon and stars have stories to tell if one watches them carefully.



White, fleecy cumulus clouds, casting no shadows, with blue sky visible between the patches, mean fine weather. When seen near the horizon, as above, they are somewhat flattened.

WE HAVE all, at some time or other, taken a turn at predicting tomorrow's weather, with varying successes. We have marveled at mariners, farmers, or woodsmen who become quite expert at forecasting weather, and wondered how they did it.

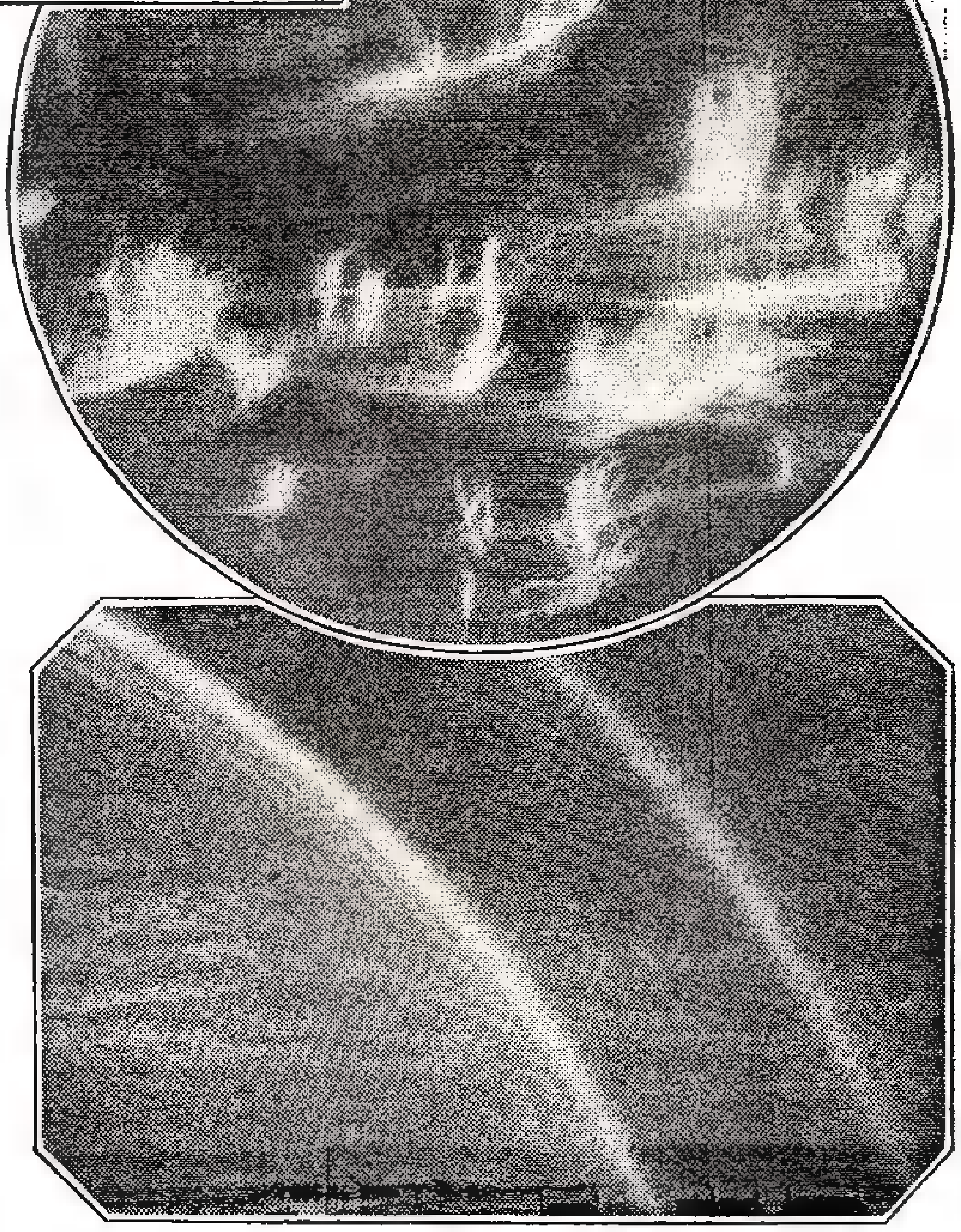
It is the simple weather signs for which these amateur prophets look, signs which can be interpreted by anyone. Only these obvious indications will therefore be discussed here.

This article, of course, cannot make you an infallible weather prophet — nothing can be so fickle as the weather. With all the latest scientific equipment at its disposal, the Weather Bureau is only 85 per cent correct, and it figures it is doing right well at that.

Four Types of Clouds

Clouds are the most obvious weather signs and are easily read when one learns their language. There are four major classifications of clouds — cirrus, cumulus, stratus and nimbus—with 27 combinations of these types. Cirrus clouds are featherlike, cumulus clouds resemble a wad of cotton, stratus clouds come in layers, and nimbus clouds are of no special shape but merely those from which rain or snow is actually falling, although sometimes the precipitation evaporates before it reaches the ground. Keeping these descriptions in mind, and referring to the photos shown here, it should be simple to identify the various types.

Everyone has noticed droplets condense on the outside of a pitcher of ice water.



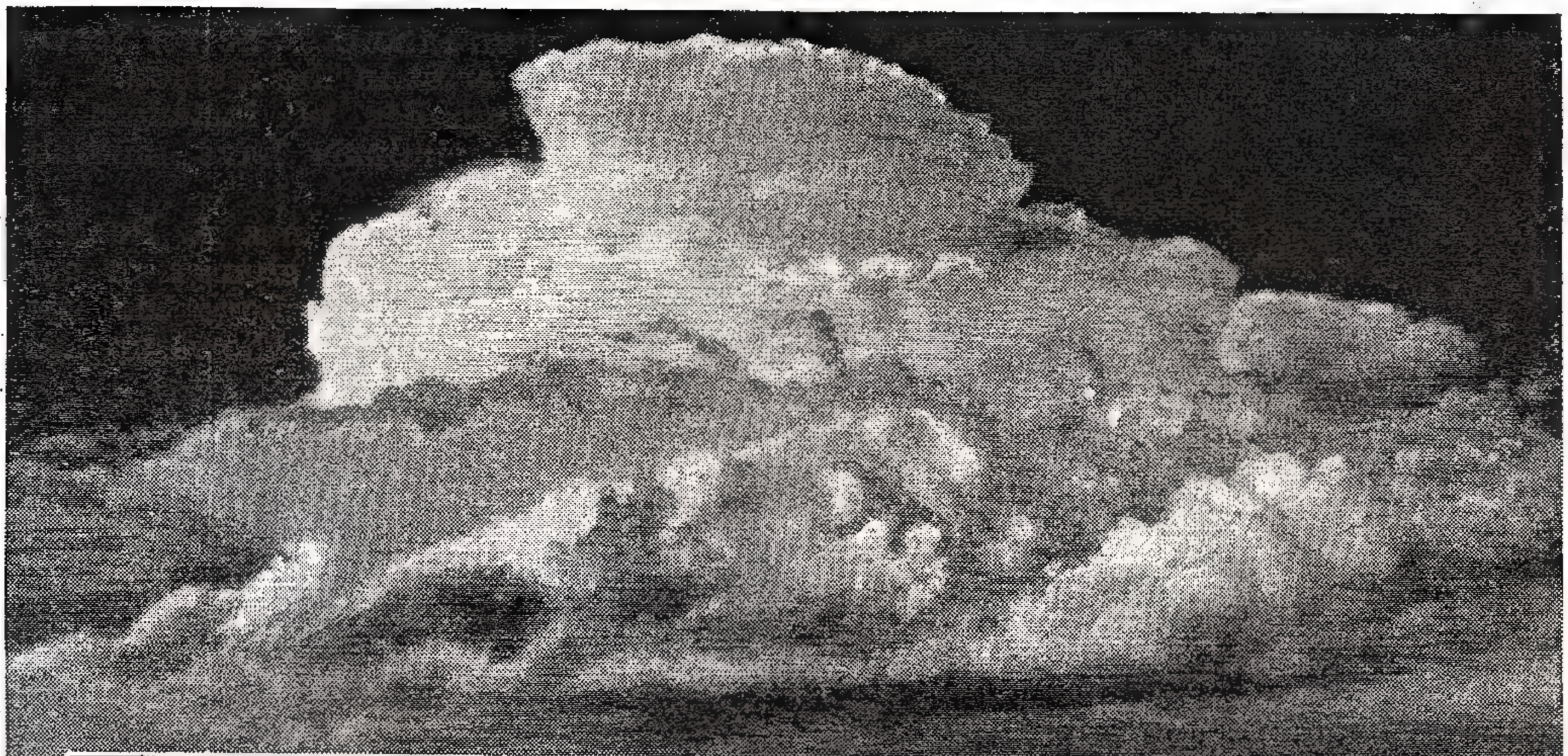
In circle: "Mares' Tails" cirrus cloud photograph taken 36 hours before storm came. These are high and feathery. Below: Rainbows are of value only in predicting weather for the same day. If in afternoon, they mean fair weather.

The same thing occurs when a cloud is formed—the moisture in the air is condensed when the air becomes cool enough, and these tiny drops become visible as clouds. Since clouds are evidence of moisture in the air, a cloudless sky is a sure sign of fair weather.

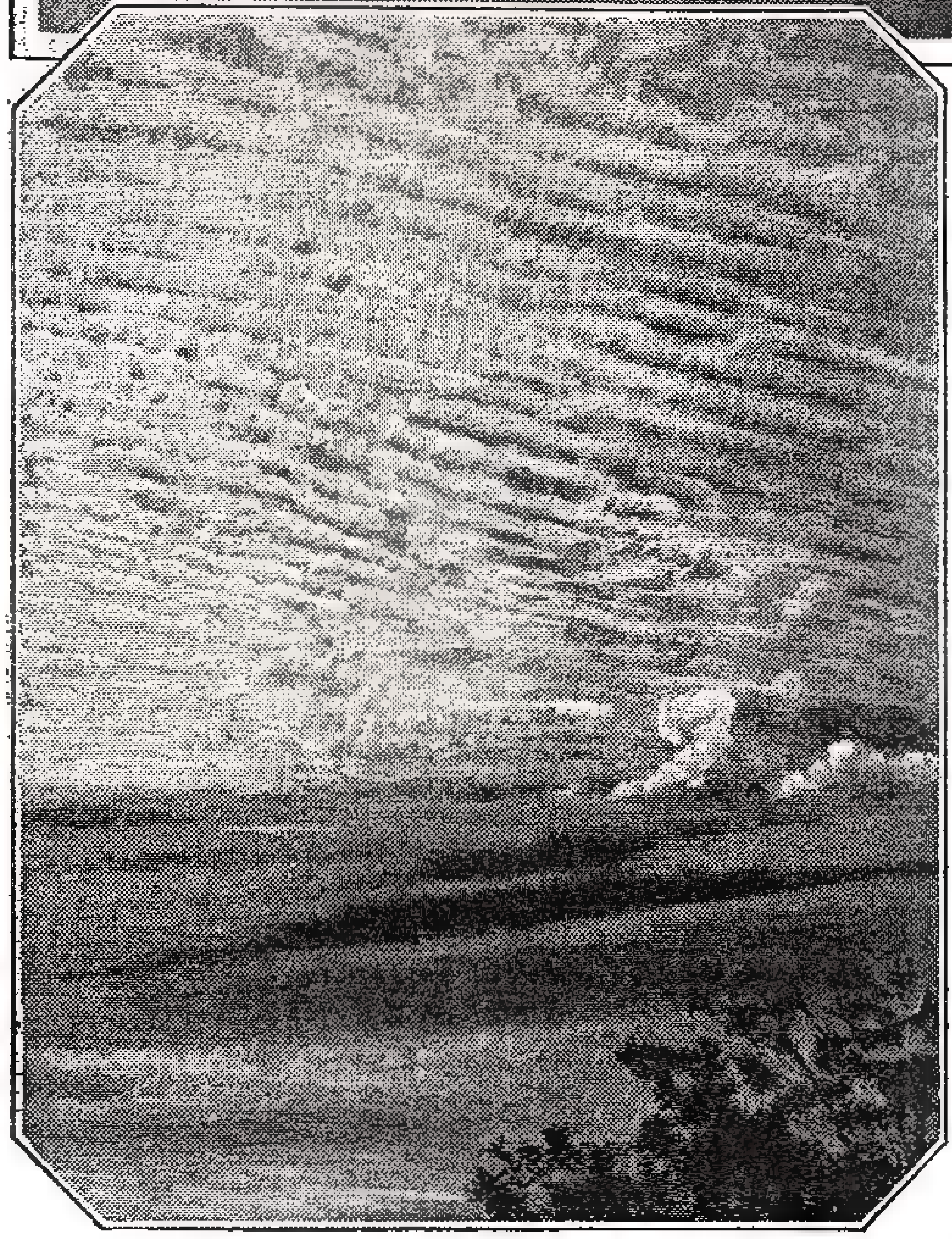
Small scattered cumulus clouds also denote fair weather. These clouds are white and fleecy, and when seen near the horizon they are plainly somewhat flattened. Sometimes they appear as large patches

WEATHER

by DR. W. J. HUMPHREYS
U. S. Weather Bureau
Washington, D. C.



Large cumulus clouds indicate showers. When anvil-shaped mass shown above appears above the towering cumulonimbus cloud formation, hail or thunderstorms are probable.



"Mackerel Sky" cirrus clouds, and similar feathery formations, forecast a storm which may be several days away. They indicate high winds, probably accompanied by rain.

of stratocumulus, but if they are soft and woolly, casting no shadows, and with the blue sky visible between the patches, they still mean fair weather.

High feathery clouds are usually the forerunner of a storm, although the storm may be several days away. These cirrus clouds often take the form of "mackerel scales and mares' tails," and indicate high winds, which will probably be accompanied by rain. Often two layers of clouds may be seen moving in different directions—a sure sign of a rapidly approaching storm.

While small cumulus clouds mean fair weather, large clouds of the same type indicate rain, usually showers. Often billowy white clouds may be seen on the horizon, the tops towering to enormous heights. These are caused by rising currents of air—a condition necessary for thunder storms. When an anvil-shaped mass appears above these towering cumulus clouds conditions are ripe for a hail storm.

Clouds May Resemble Waves

Occasionally cumulus clouds take the form of a wave breaking on the sea shore, forming a long line that seems to be rolled along. This is known as a line squall. It indicates the meeting of winds from opposite directions, causing strong ascending and descending air currents, and will invariably be accompanied by violent showers, high winds, and a considerable drop in temperature.

Dark, low, ragged clouds indicate bad weather, usually a long period of steady rain. This type is known as nimbus, and is usually without any definite shape. Often such clouds will be present a long time before rain actually starts to fall, or the rain may cease though the shapeless gray mass of cloud persists for some time.

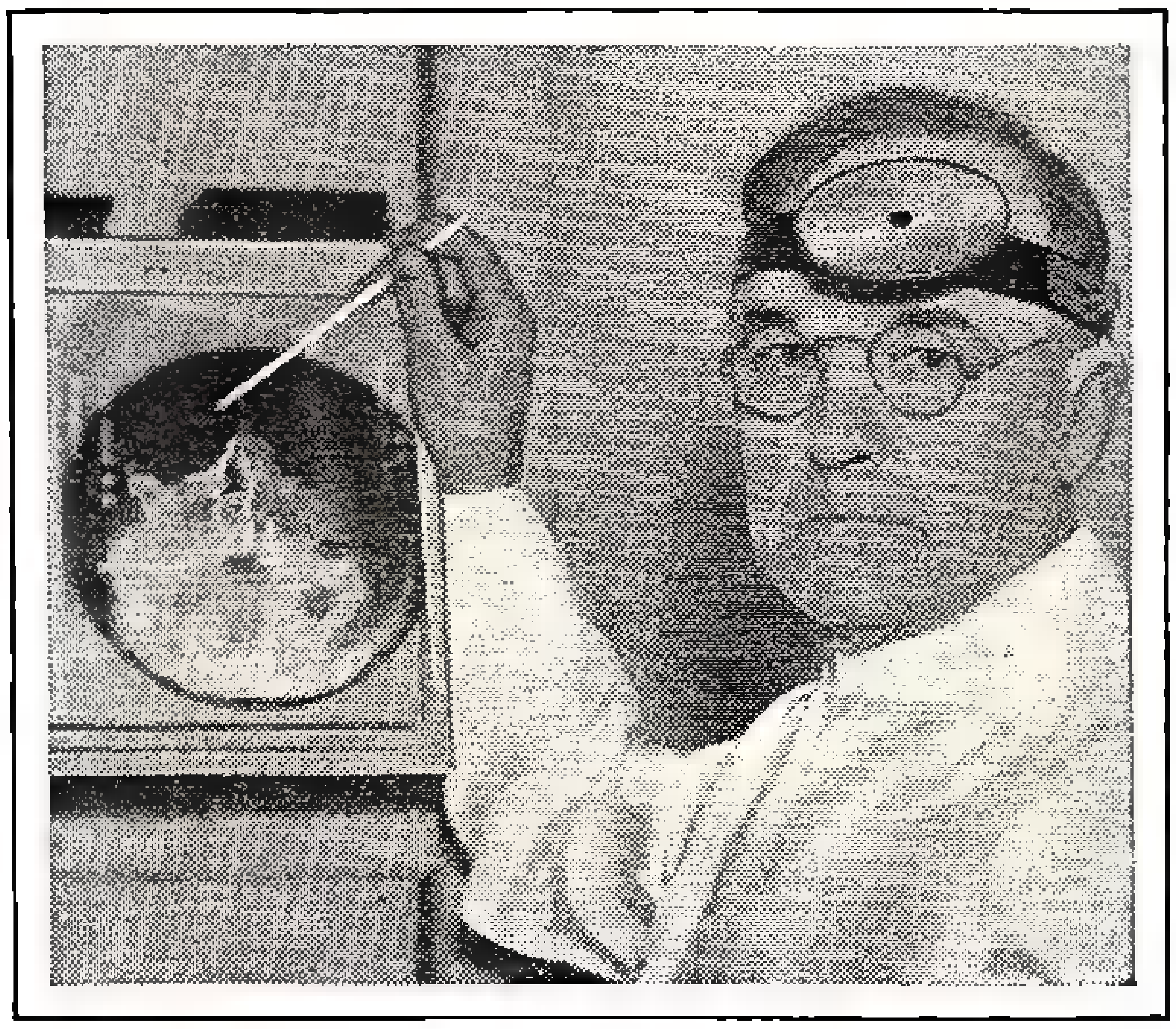
(Continued on page 120)

X-Rays of Criminals' Skulls May Replace Fingerprints

SCIENTISTS have worked out a sure means of identification of people that may some day replace fingerprinting. Scotland Yard and the U. S. Secret Service have shown interest in the method.

Already a number of instances are known where criminals have mutilated their fingertips.

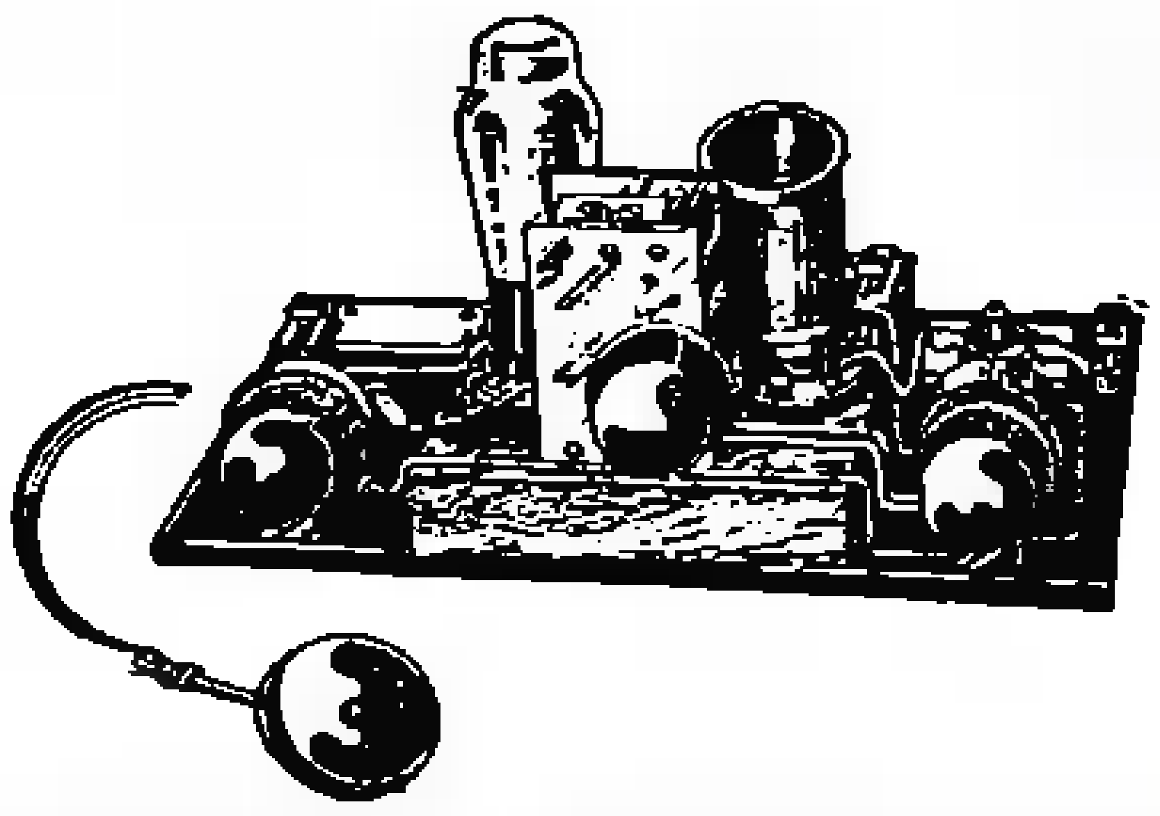
According to Dr. Thomas A. Poole of Washington, the frontal sinuses of each individual, located just above the nose, are different. X-ray plate shows up these individual peculiarities.



Dr. T. A. Poole points to X-ray of frontal sinus, just above root of nose, which may be used for criminal identification.

All-Wave Radio Has But One Tube

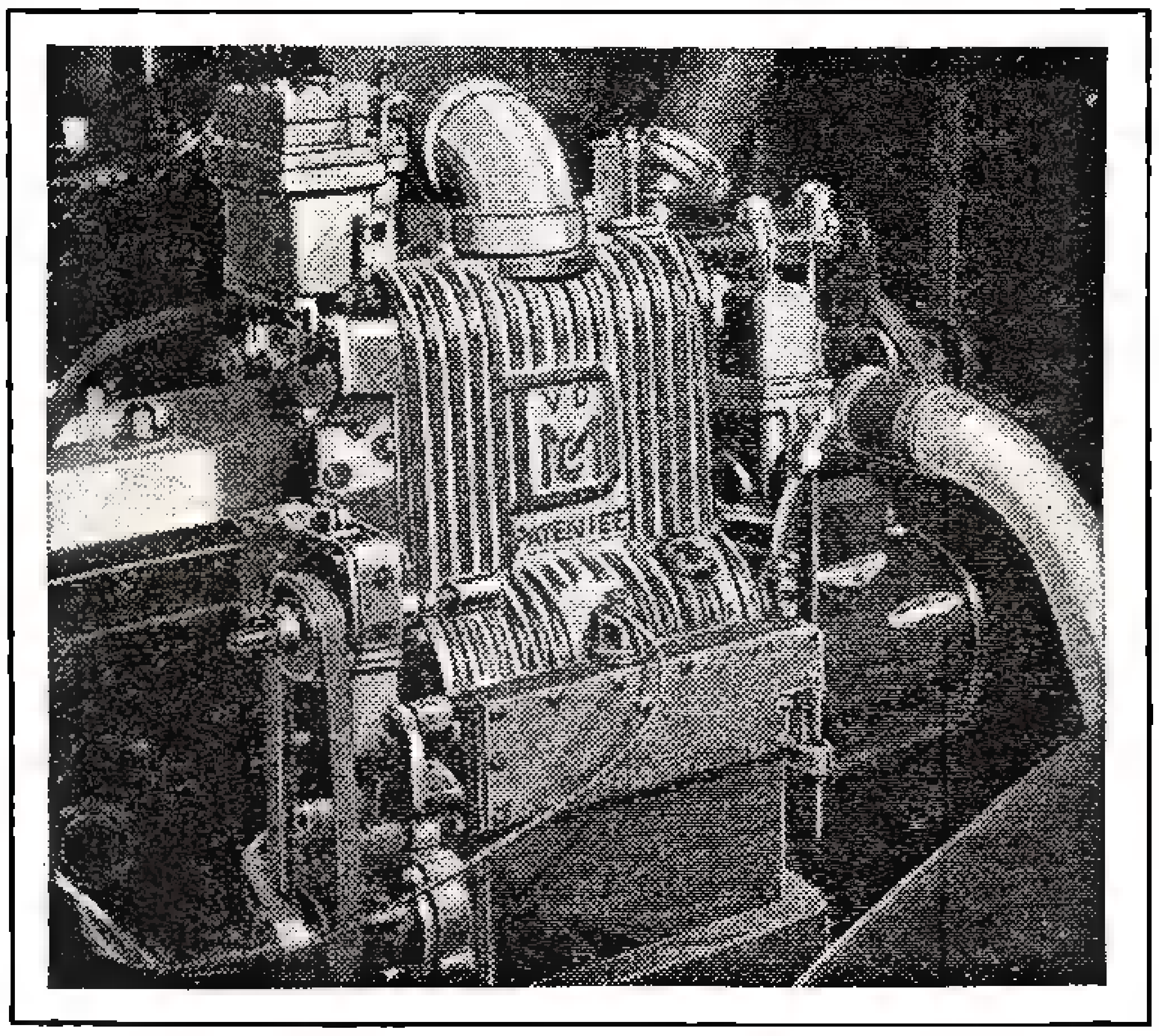
A ONE - TUBE all - wave radio set is now available in kit form which requires no wiring diagrams. All terminals are color - coded, so like colors are connected.



One tube all-wave radio brings in foreign short wave programs on headphones. Manufacturer also supplies construction kit.

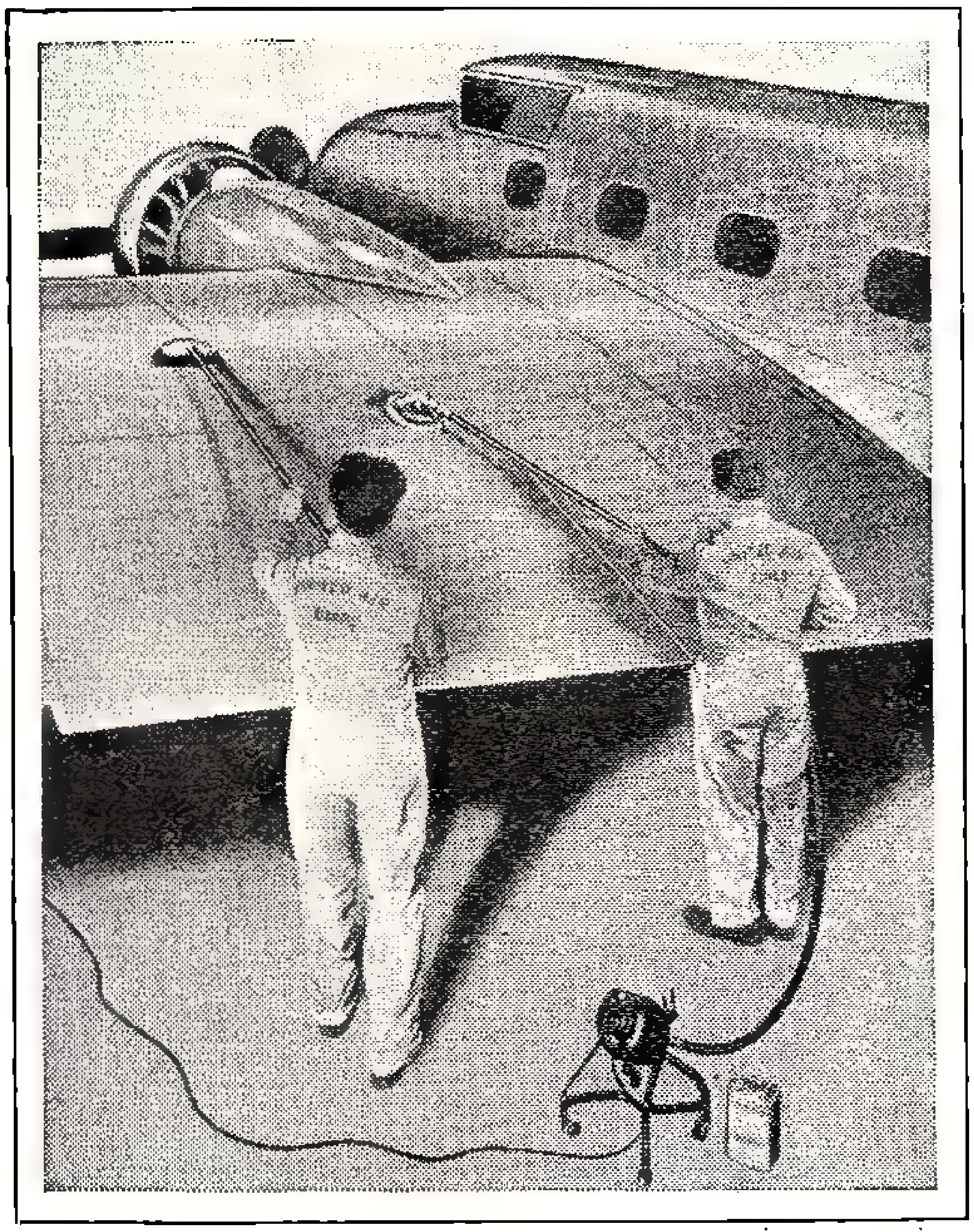
Auto Device Changes Oil to Gas

A CONVERTER unit invented by Vincent McDonnell, Chicago inventor, actually changes cheap fuel oil into a fixed gas that operates auto engines. In first tests car made 40 miles per gallon of oil. Fuel oil costs are only about one-third those for regular gasoline.



New converter unit fitting on any auto permits use of fuel oil instead of gasoline, with much greater mileage.

Wax Plane Wings for More Speed



Transport air liner wings being waxed. Floor wax is rubbed into wing surface by electrically driven brushes attached on long handle. Speed is increased 3 m.p.h. by this means.

THE wings of our huge air liners are now being waxed regularly, after tests showed that the mere waxing of the wing surfaces boosted the speed as much as three miles an hour.

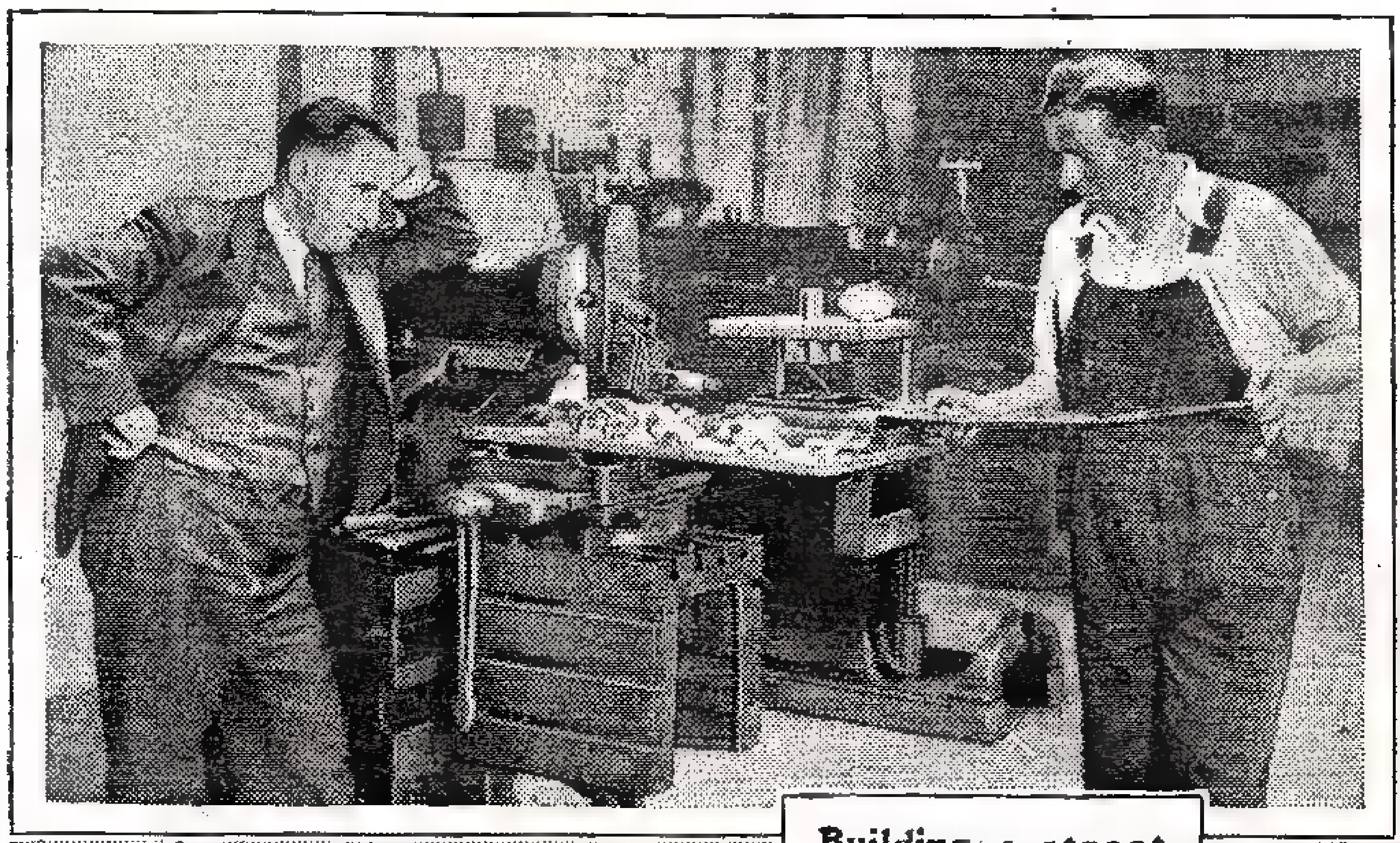
It is believed that the wax smooths out the irregularities in the wing material, thereby reducing air friction.

Invention Catches Slug Passers

A NEWLY invented subway turnstile shouts "Stop thief!" when an attempt is made to insert a lead slug. In addition the machine can be made to douse the malefactor with water.

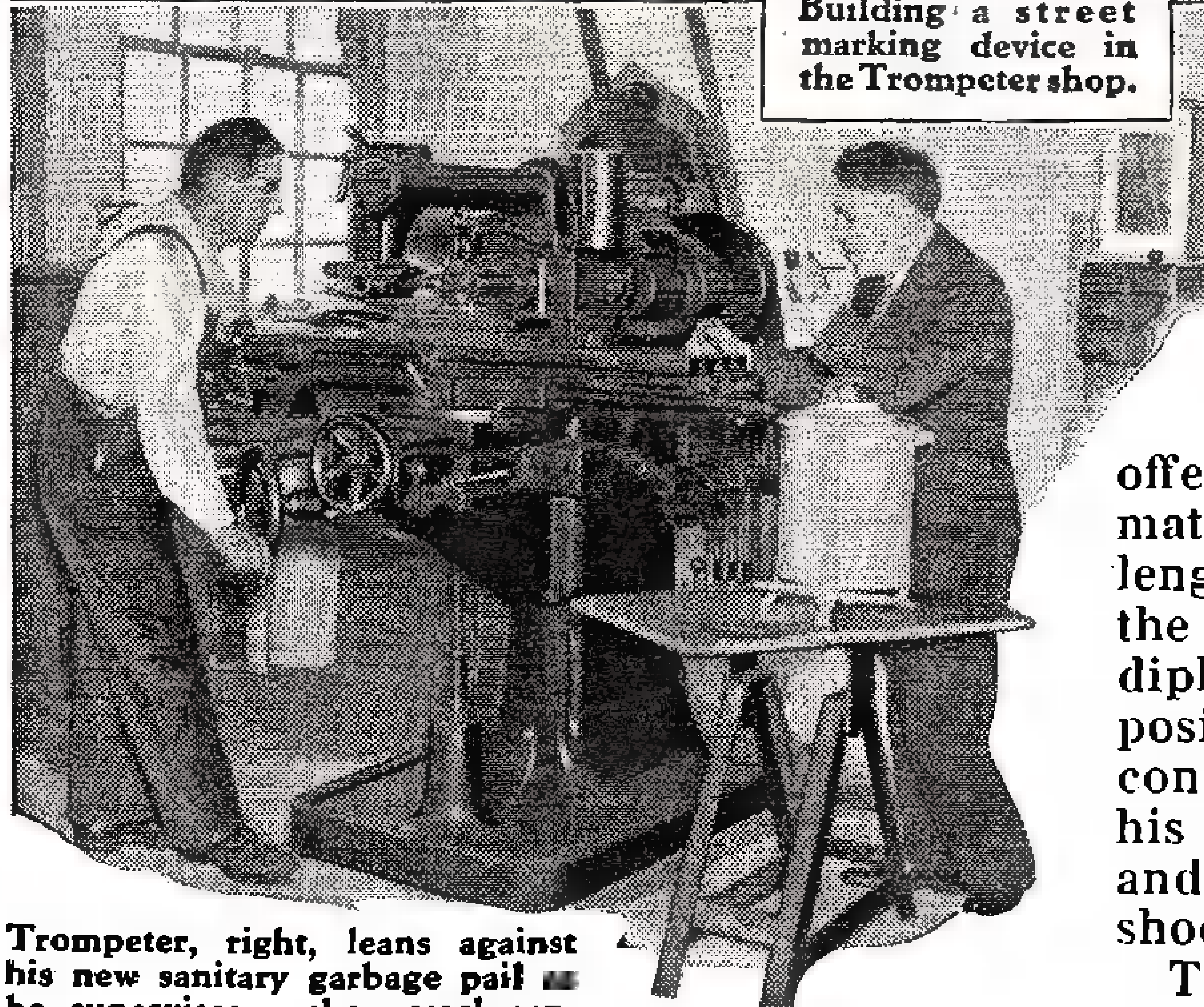
Professor A. C. Seletsky, inventor, designed the machine for use on subway turnstiles and vending machines.

Gadgets Net Edison Disciple $3,000,000



Building a street marking device in the Trompeter shop.

Here is Trompeter's latest gadget—a flashlight dental mirror which lights up the mouth, enabling the subject to get a perfect view of needed dentistry, reflected in the large magnifying mirror.



Trompeter, right, leans against his new sanitary garbage pail as he supervises a shop workman.

OUT of such commonplace gadgets as floor oilers, egg slicers and garbage pails, David Dewey Trompeter, disciple and one-time associate of Thomas Alva Edison has made $3,000,000.

As a boy of nine, back in Westchester county, New York, Trompeter began the tinkering that was later to lead to fame. Bitten by the aviation bug—that was back in 1906—he made model airplanes which sold for $5 and $10. Selden, one of the original inventors of the automobile, was a neighbor. The boy haunted the Selden shop, soaking up mechanical principles which later led to the invention of such prosaic but salable gadgets as the floor oiler, a soap solution dispenser and a long-handled scrubbing brush. The devices caught the fancy of the buying public and Trompeter eagerly sought newer and more profitable fields to conquer.

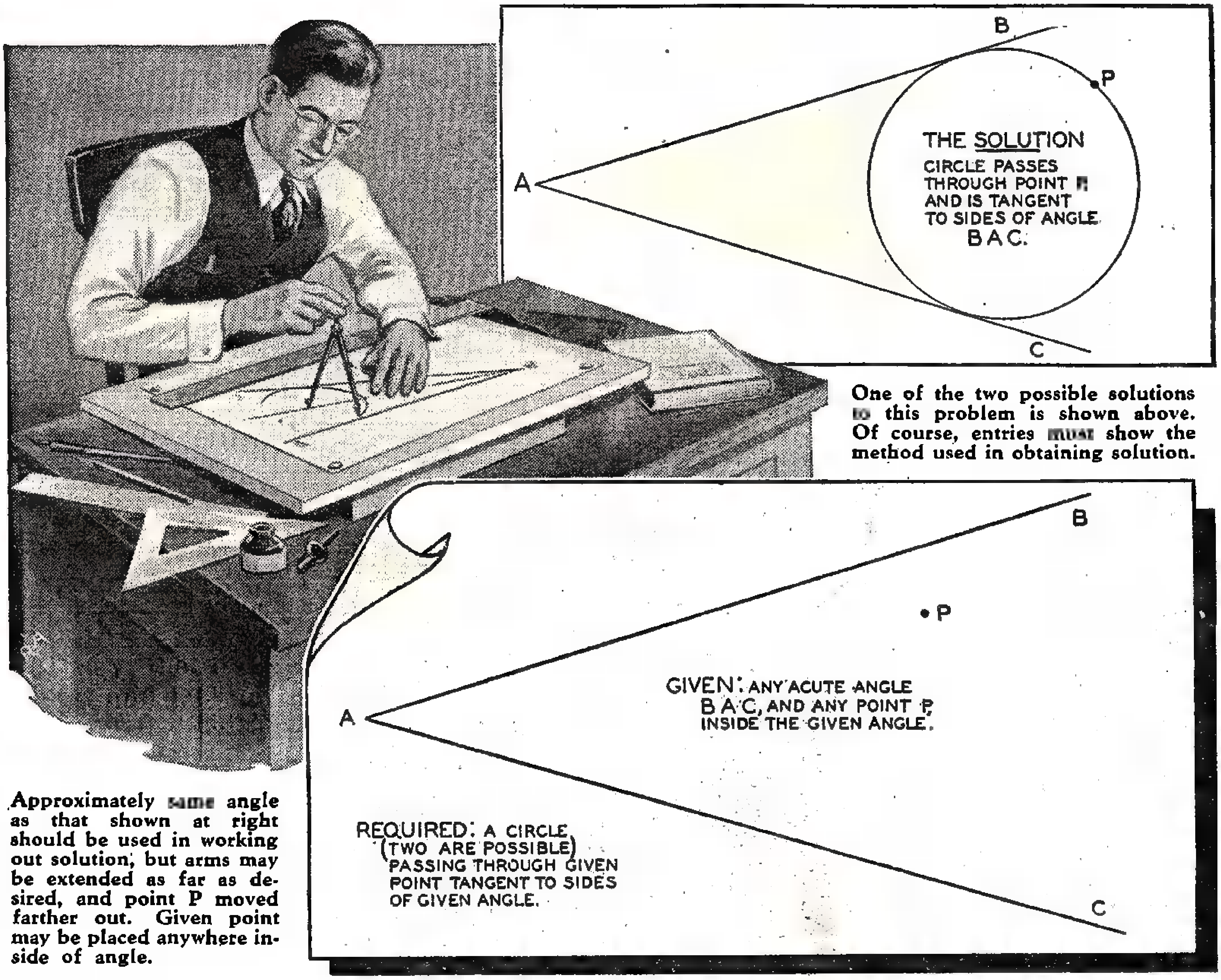
He entered contests, collected a bonus of $250 for a collapsible cigar case and went gunning for bigger inventive game. About two years before the outbreak of the World war, the German government offered $10,000 for a non-rubber pneumatic tire. Trompeter took up the challenge, solved the problem and then refused the reward when he learned of certain diplomatic strings to the offer, later disposing of the invention to an American concern. Between times he constructed his wire egg-slicer, dabbled in aeronautics and invented the forerunner of the modern shock-absorbing airplane landing gear.

The grim necessities of war brought the Trompeter genius to Uncle Sam's attention. There were secret conferences. Trompeter went back to his shop to emerge presently with a new bomb carriage and a multiple shell whose sections exploded at timed intervals. Each of the sections was released by an explosion compelling the remainder of the unit to continue its flight along a straight line—the same principle used today in experiments with rocket plane motors. Trompeter expected no pay for these devices, and received none except the thanks of a grateful government.

Since that time, Trompeter has turned out automatic doughnut and cotton-picking machines, gadgets enabling the blind to "see" and the deaf to hear—everything from auto skid chains to halitosis indicators.

The stock market and the depression wiped out most of Trompeter's fortune. Undaunted, he hopes to make another. If only moderate rewards are forthcoming, he'll still be satisfied, knowing that products of his hand and brain are making life easier and simpler for the other fellow.

$25 in PRIZES for Geometry Problem


B
P
A
THE SOLUTION
CIRCLE PASSES THROUGH POINT P AND IS TANGENT TO SIDES OF ANGLE BAC.
C
B
P
GIVEN: ANY ACUTE ANGLE BAC, AND ANY POINT P INSIDE THE GIVEN ANGLE.
A
REQUIRED: A CIRCLE (TWO ARE POSSIBLE) PASSING THROUGH GIVEN POINT TANGENT TO SIDES OF GIVEN ANGLE.
C

One of the two possible solutions to this problem is shown above. Of course, entries must show the method used in obtaining solution.

Approximately same angle as that shown at right should be used in working out solution, but arms may be extended as far as desired, and point P moved farther out. Given point may be placed anywhere inside of angle.

FOR those who like to spend an hour or so with compass and drawing triangles, this geometry problem will prove very interesting. Here it is:

Draw a circle which shall pass through a given point inside a given acute angle, and be tangent to the sides of the angle.

For the best methods sent in for solving this problem, MODERN MECHANIX AND INVENTIONS offers $25, as follows: First prize $10; second $5; and four third prizes of $2.50 each. Accuracy, promptness, and simplicity, rather than elaborate drawings will be considered in awarding prizes.

To be eligible for any awards, contestants must give age, occupation, and education. This information will not, however, be considered in the awarding of prizes.

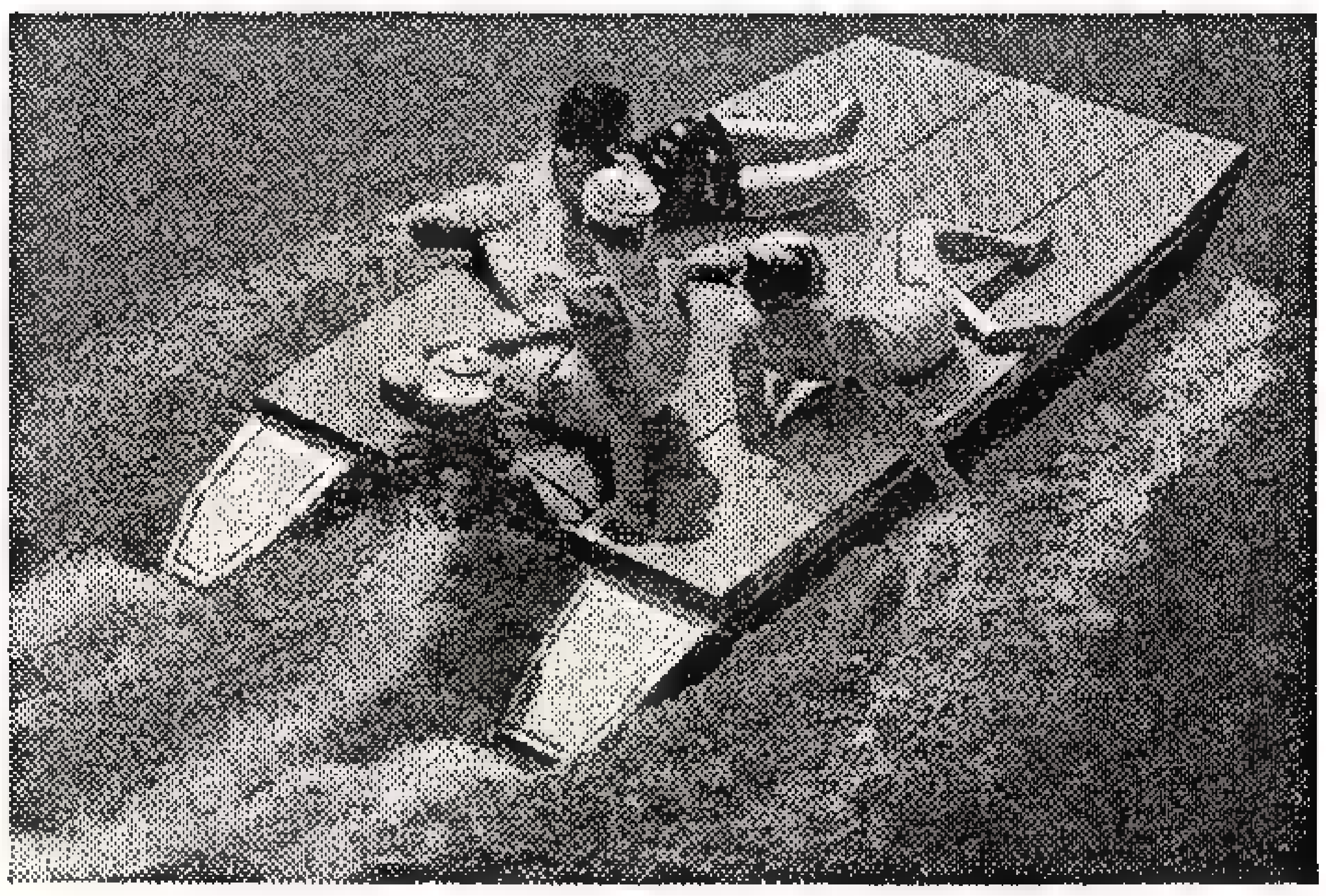
Your entry should be postmarked not later than April 25, 1934. Decision of the judges, who will be MODERN MECHANIX AND INVENTIONS editors, is final. In case of ties, duplicate prizes will be awarded.

Employees of this magazine or their relatives are not eligible to compete. You don't have to buy a copy or be a subscriber to enter. Address M-M GEOMETRY CONTEST, 529 So. 7th St., Minneapolis, Minn.

Raft Driven by Outboard Motor

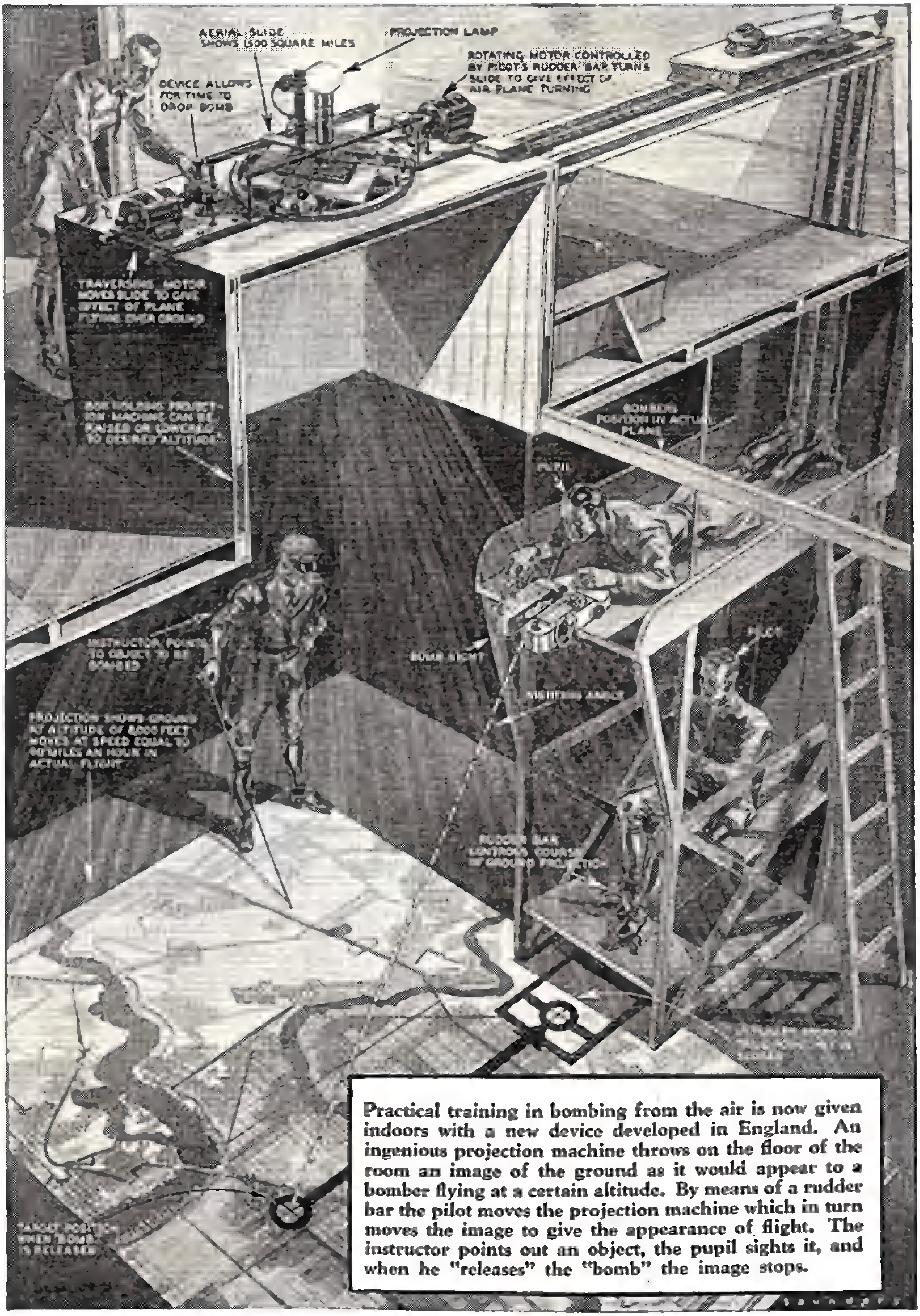
WATER sports enthusiasts have found a new use for the outboard boat engine. Queer pontoon-like rafts are being driven over the inland lakes at surprisingly high speeds by outboard engines mounted at the rear.

The entire raft lies but a few inches above water. From a distance the bathers appear to be skimming over the waves with no visible means of support.



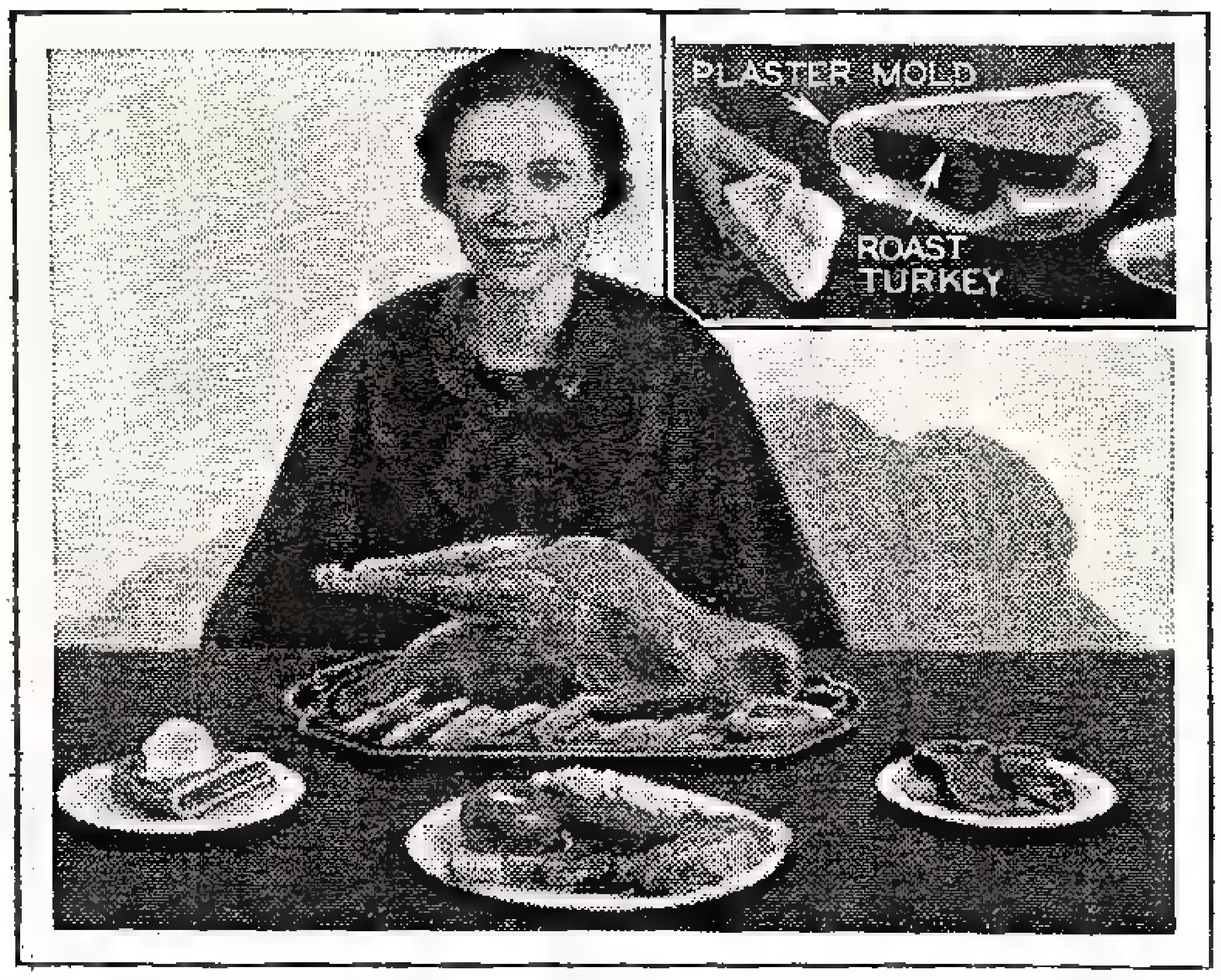
This queer speed raft skims over the water like a boat. Long pontoons on each side give buoyancy, and reduce friction.

Realistic Air BOMBING Taught Indoors


AERIAL SLIDE SHOWS 1500 SQUARE MILES
PROJECTION LAMP
ROTATING MOTOR CONTROLLED BY PILOT'S RUDDER BAR TURNS SLIDE TO GIVE EFFECT OF AIR PLANE TURNING
DEVICE ALLOWS FOR TIME TO DROP BOMB
TRAVERSING MOTOR MOVES SLIDE TO GIVE EFFECT OF PLANE FLYING OVER GROUND
BOX HOLDING PROJECTION MACHINE CAN BE RAISED OR LOWERED TO DESIRED ALTITUDE
BOMBER'S POSITION IN ACTUAL PLANE
PUPIL
INSTRUCTOR POINTS TO OBJECT TO BE BOMBED
BOMB SIGHT
PILOT
SIGHTING ANGLE
PROJECTION SHOWS GROUND AT ALTITUDE OF 8000 FEET MOVES AT SPEED EQUAL TO 90 MILES AN HOUR IN ACTUAL FLIGHT
RUDDER BAR CONTROLS COURSE OF GROUND PROJECTION
TARGET POSITION WHEN BOMB IS RELEASED

Practical training in bombing from the air is now given indoors with a new device developed in England. An ingenious projection machine throws on the floor of the room an image of the ground as it would appear to a bomber flying at a certain altitude. By means of a rudder bar the pilot moves the projection machine which in turn moves the image to give the appearance of flight. The instructor points out an object, the pupil sights it, and when he "releases" the "bomb" the image stops.

Petrified Display Dinners Made From Real Roast Turkey



Petrified wax foods made by two Minnesota college men retain their freshness even in blazing sun. Inset shows plaster mold which is first made from original cooked food. Wax is poured in mold, cooled, and painted natural colors.

PETRIFIED foods are now a reality. Van Olkon and Arthur Cohler, two young Minneapolis college graduates, have developed a secret wax composition which can be molded into realistic imitations of absolutely any food. The new wax foods keep their fresh appearance even with the burning summer sun beating down on show windows.

Wax foods are used by restaurants, by ice cream manufacturers, or by anyone who wants to display a perishable product. Green peppers filled with gleaming macaroni, and topped with rich yellow cheese, turkeys roasted and fairly dripping with delicious gravies, and even chocolate candy are duplicated in wax with a naturalness that is unbelievable.

In making a turkey model, the chef first bakes a real turkey in the ordinary style, basting it with rich sauces. The fowl is coated with stearin and kerosene, and a plaster mold made. The mold is cut apart, the bird removed, and the rejoined mold filled with the wax compound.

Red Hand Signal Directs Traffic

A RED hand controls the heavy traffic on Fifth avenue in New York City.

Faced with the problem of speeding up pedestrian traffic and cutting down casualties, experts have evolved a new scheme.

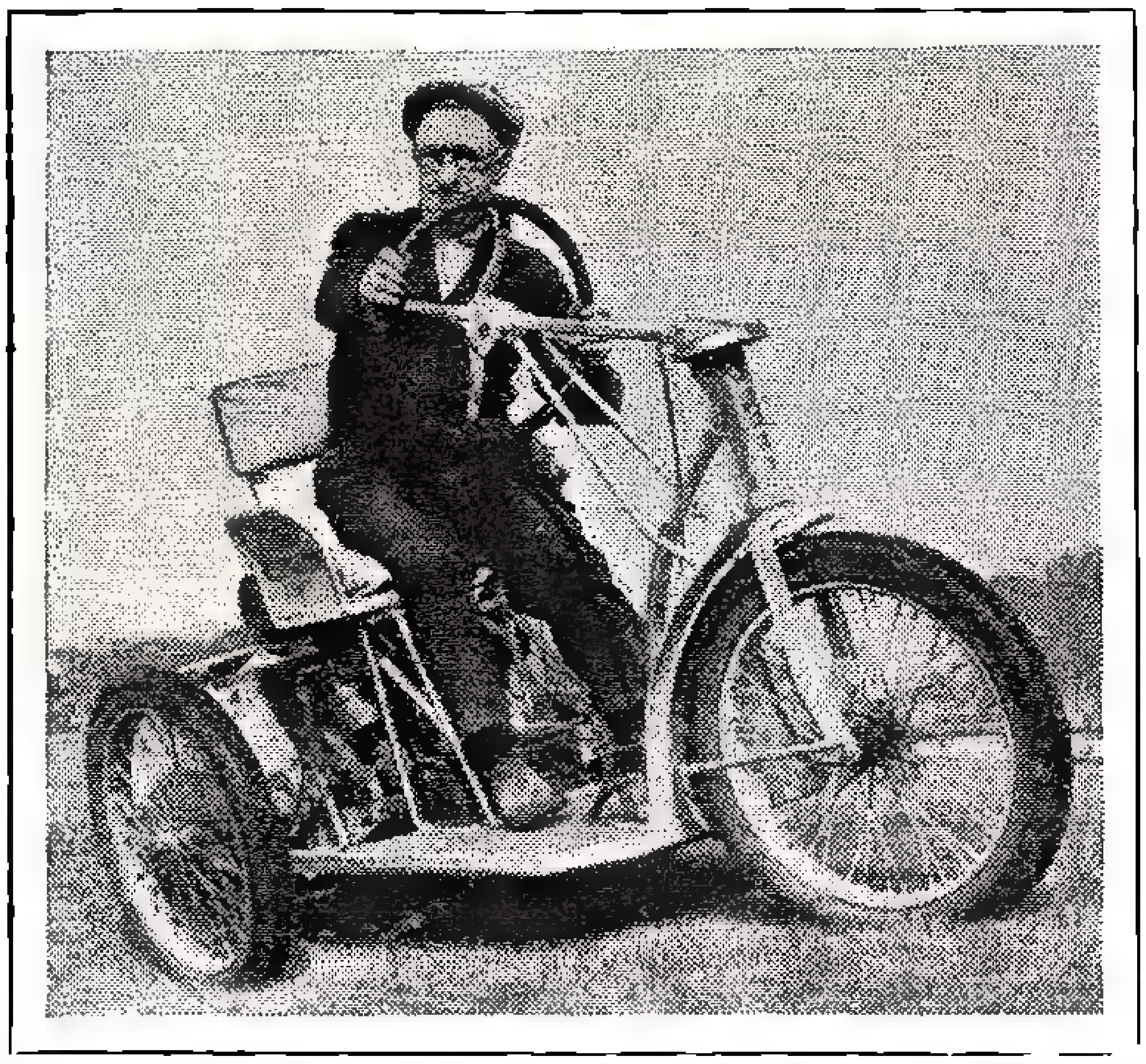
New signal towers have signals for autoists and signals for pedestrians, the latter in the form of a red hand on all four faces of each tower.

Under this plan, pedestrian traffic will be given twenty seconds to clear in all directions as the signals change. Then automotive traffic travels in a specified direction for a period ranging from thirty to fifty-eight seconds.

A five second pause is permitted between the twenty seconds allotted pedestrians and the next automotive "go" signal.

This picture shows New York City's latest traffic control device. It is a combined pedestrian and auto signal, with the red hand for pedestrians. Contrast this with the old type signal also shown in this picture.

Rides Golf Course in Silent Car



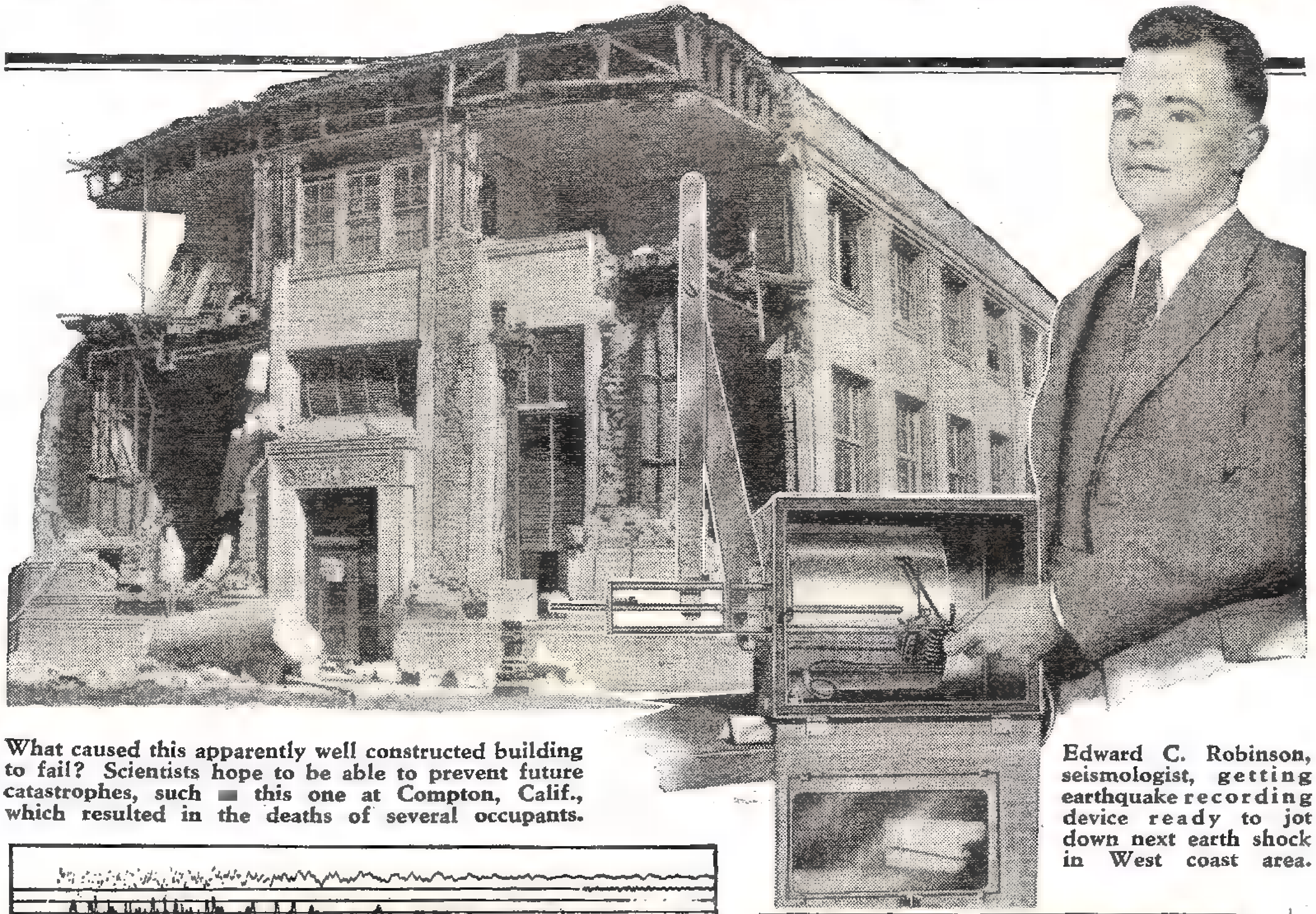
Tom Lesure, greens keeper at the Pasadena municipal golf links, is here shown patrolling the greens in his specially built three wheel car. It runs sixteen miles a day.

ABLE to travel across hazards, over fairways and through the rough, this odd three wheeled vehicle shown above is used by Tom Lesure, greens keeper at the Pasadena, Cal., Municipal Golf Course, in patrolling the well known California links.

The car is light enough for use on any part of the course without tearing up the turf, and as it drives through a friction clutch and is well muffled, there is no noise to disturb players.

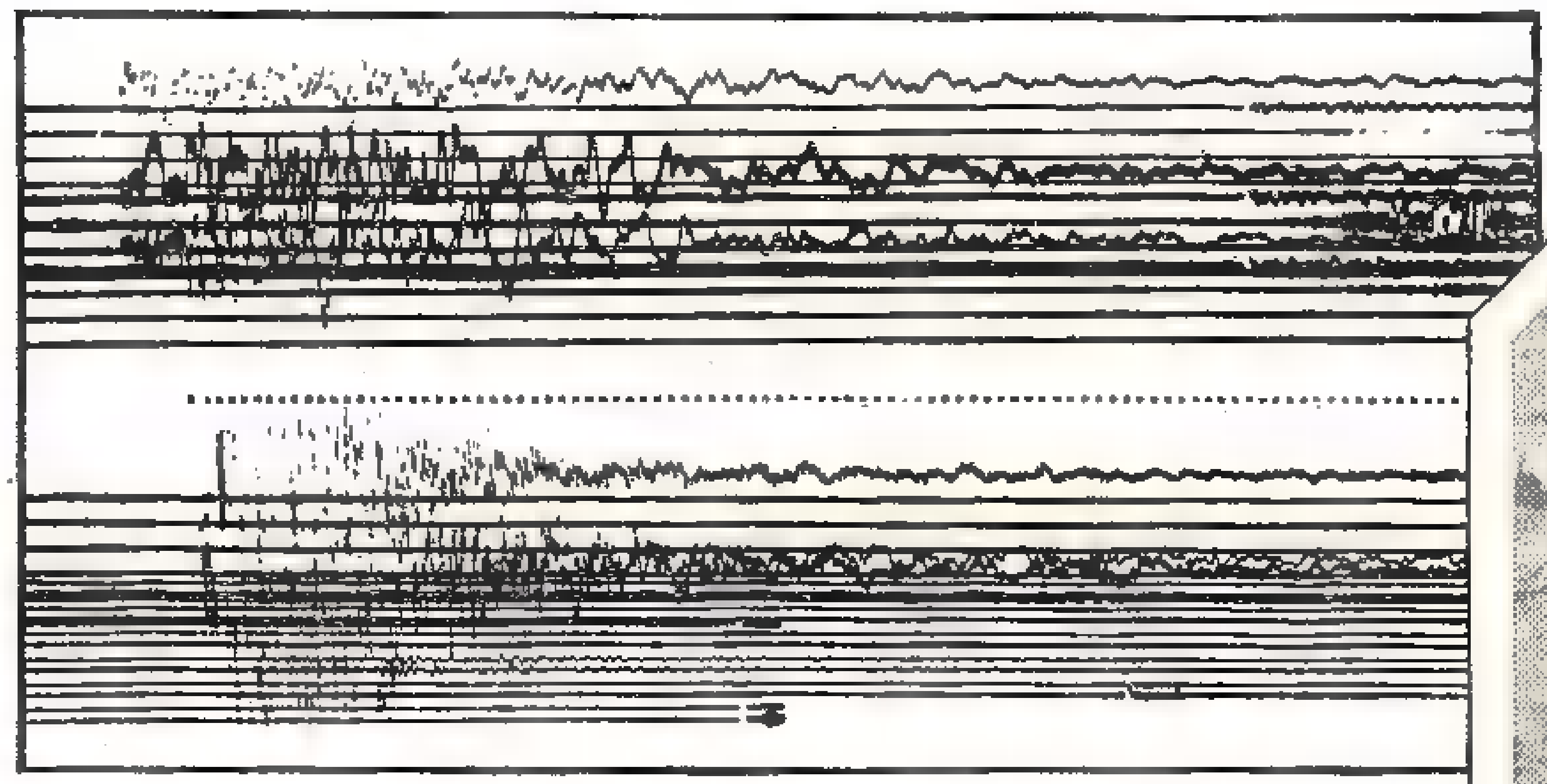
The use of this car saves Mr. Lesure not only hours of time, but an average of 16 miles walking every day.

Science to Rob Earthquakes of TERROR



What caused this apparently well constructed building to fail? Scientists hope to be able to prevent future catastrophes, such as this one at Compton, Calif., which resulted in the deaths of several occupants.

Edward C. Robinson, seismologist, getting earthquake recording device ready to jot down next earth shock in West coast area.



Here are seismograph records of disastrous Long Beach quake of March 10, 1933. Upper record taken in Los Angeles shows quake intensity much less. Lower sheet shows Long Beach record. Lower right photo shows United States Coast and Geodetic Survey engineers gathering data of shifting land masses to make quake predictions.

ELIMINATION of the tragic toll of human life and wrecked property, claimed every time an earthquake of major proportions is felt, is now believed near.

By means of measurements taken at regular intervals, scientists determine where the horizontal and vertical stresses that cause earthquakes are accumulating.

Contrary to common belief, earthquakes have been accurately predicted. Shortly before his death, T. Omari, outstanding Japanese seismologist, warned of a major quake which he predicted would wipe out a certain fishing community. The village was ordered evacuated. The quake arrived on schedule, but not one life was lost.

Similar methods are now being employed in California. Thirty-nine seismographs have already been placed in various key locations in that state, principally in buildings. In this manner a careful check of the motion of buildings during quakes will be obtained. After a temblor, the records will be compared and effects of the earth motions upon certain types of structures studied with the idea of eliminating dangers.

WHAT'S WRONG With

by

Lieut. John Edwin Hogg, U.S.N.R.

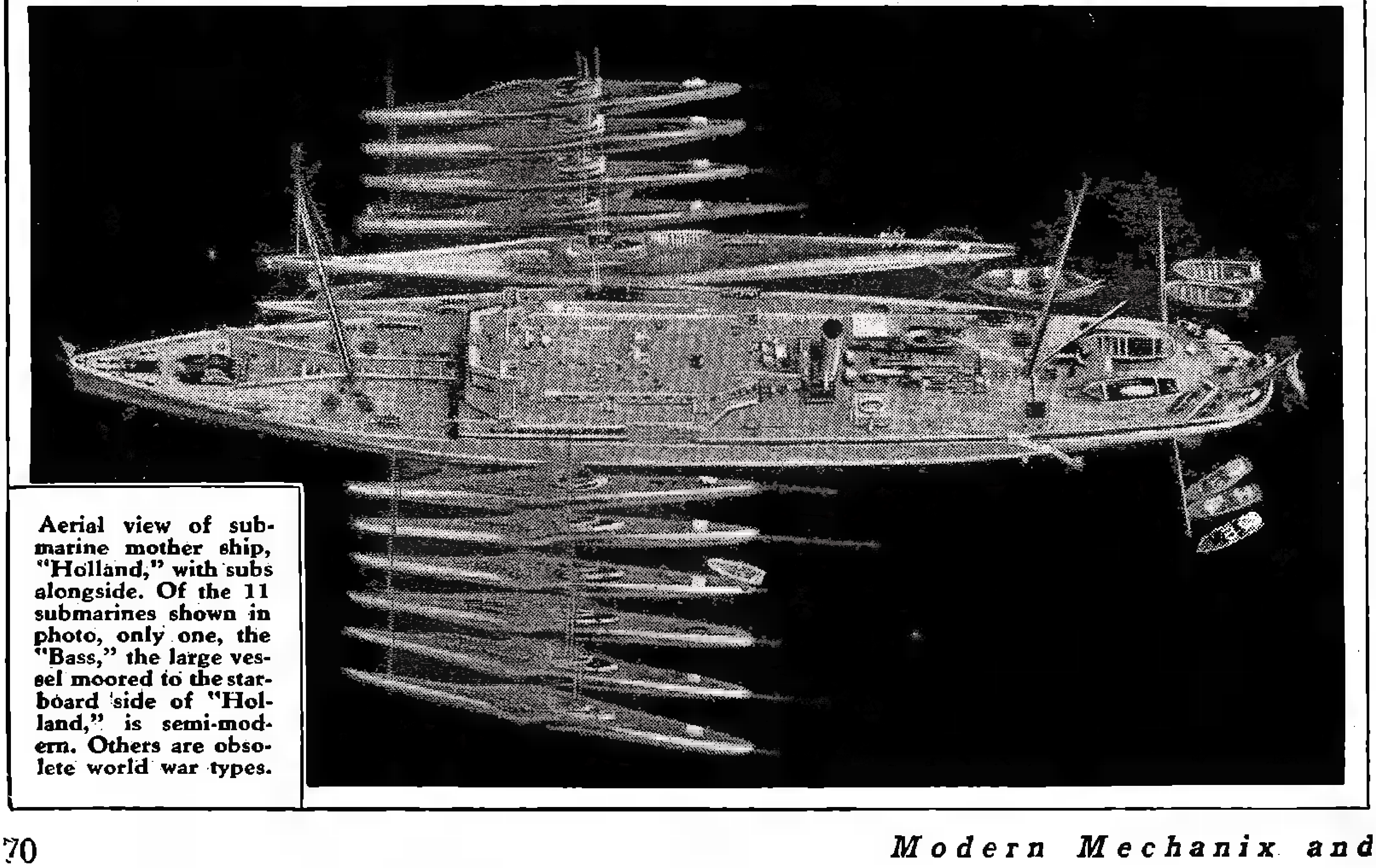
Lieutenant John Edwin Hogg, U.S.N.R., author of this article, has just completed a tour of duty with the fleet in Pacific waters and the facts he learned are well told. He backs up his "bigger Navy" plea with concrete reasoning.

(NOTE: *The views and opinions expressed herein are those of the author and should not be construed as reflecting the official views or opinions of the Navy Department.*)

AS THESE lines are written the American navy is in the worst condition of decrepitude and impotence that has ever marked its history.

Pacifist domination and sheer neglect has left us with a navy so skeletonized and anaemic as to threaten our national security. Among some none-too-friendly neighbor nations armed to the teeth and in a world seething with social, political, and economic unrest, we find ourselves with a run-down battle fleet that is only 65 per cent of the estimated strength necessary for national defense. Moreover, this precariously weakened "first line of national defense" is only 85 per cent manned!

The Roosevelt administration is striving desperately "to do something about it." Recently congress fired a heartening broadside by assuring appropriations for new ships that will bring the U. S. Navy up to full treaty strength. Into these vessels will go improvements in design, speed, gunfire and cruising range developed since the World War. In the air the navy will augment both its offense and defense. A third aircraft carrier, floating a new swarm of planes plus large caliber anti-aircraft



Aerial view of submarine mother ship, "Holland," with subs alongside. Of the 11 submarines shown in photo, only one, the "Bass," the large vessel moored to the starboard side of "Holland," is semi-modern. Others are obsolete world war types.

UNCLE SAM'S NAVY?

A naval officer frankly discloses just how badly American defense has suffered through inadequate building program.

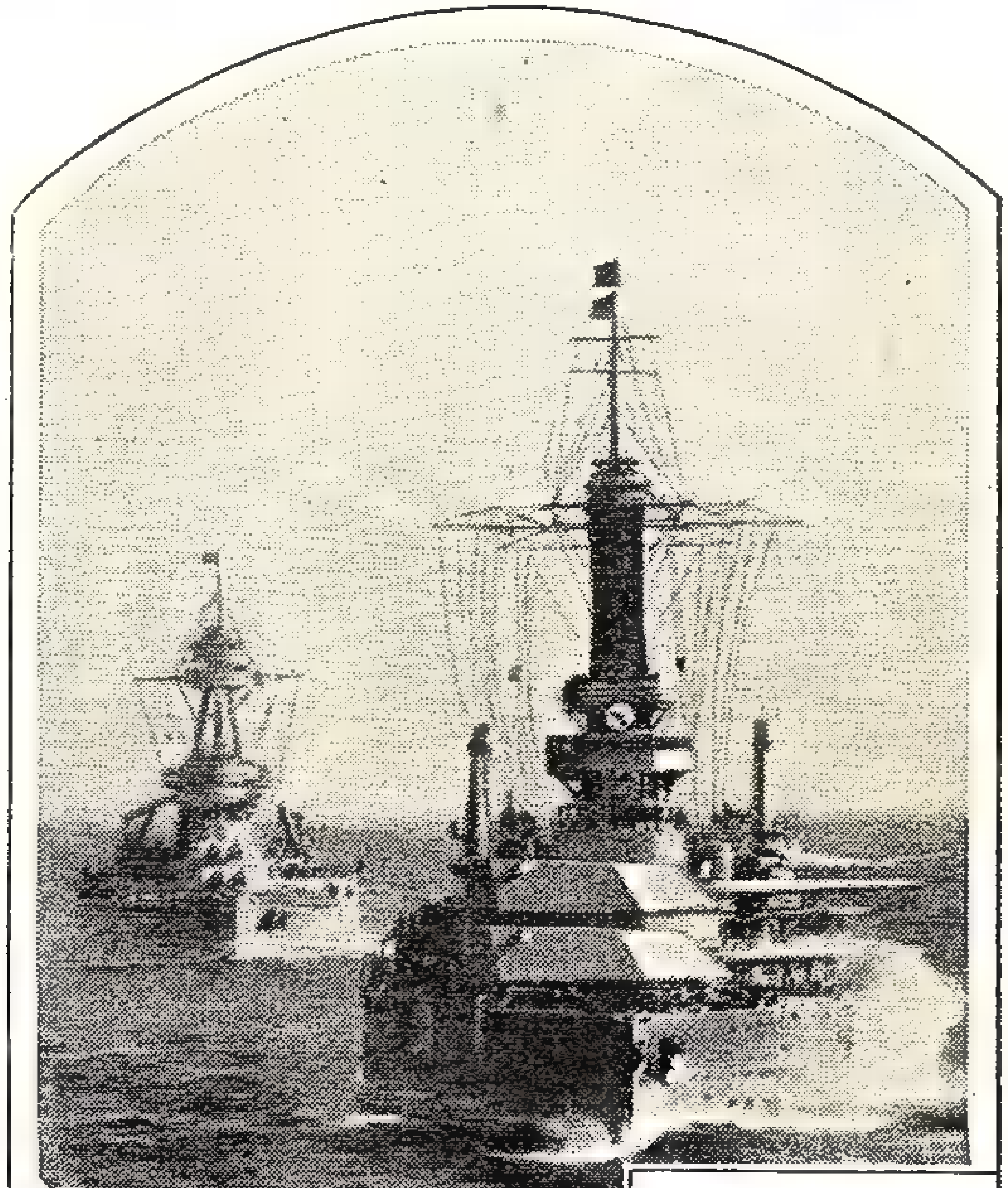
weapons and new machine guns will further bolster the defense.

The close of the World War found the leading nations financially impoverished, sick of war, and plunged into a new competitive race of armament building. This country made an honest and sincere effort to influence the other nations to make drastic reductions in both military and naval armament. To that end we called the Washington Naval Conference of 1922. So enthusiastically did we plunge into that conference that in the words of the late Admiral William A. Moffett, who went to his death in the wreck of the airship *Akron*, "Uncle Sam lost everything but his shirt tails when he signed the Washington Treaty."

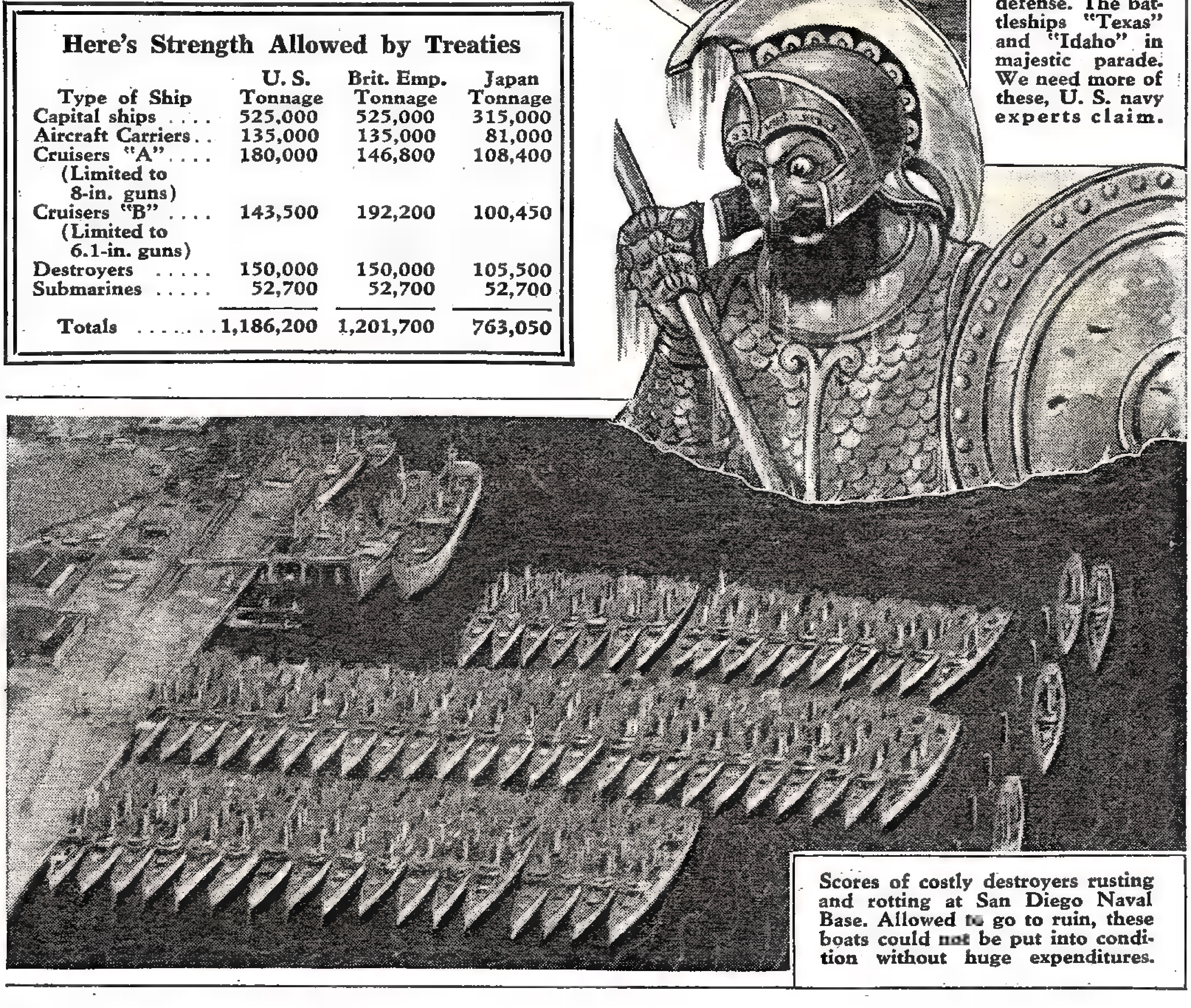
As a gesture of our peaceful intentions toward Japan and other nations of the

Here's Strength Allowed by Treaties

Type of Ship	U. S. Tonnage	Brit. Emp. Tonnage	Japan Tonnage
Capital ships	525,000	525,000	315,000
Aircraft Carriers . .	135,000	135,000	81,000
Cruisers "A" . . . . (Limited to 8-in. guns)	180,000	146,800	108,400
Cruisers "B" . . . . (Limited to 6.1-in. guns)	143,500	192,200	100,450
Destroyers	150,000	150,000	105,500
Submarines	52,700	52,700	52,700
Totals	1,186,200	1,201,700	763,050

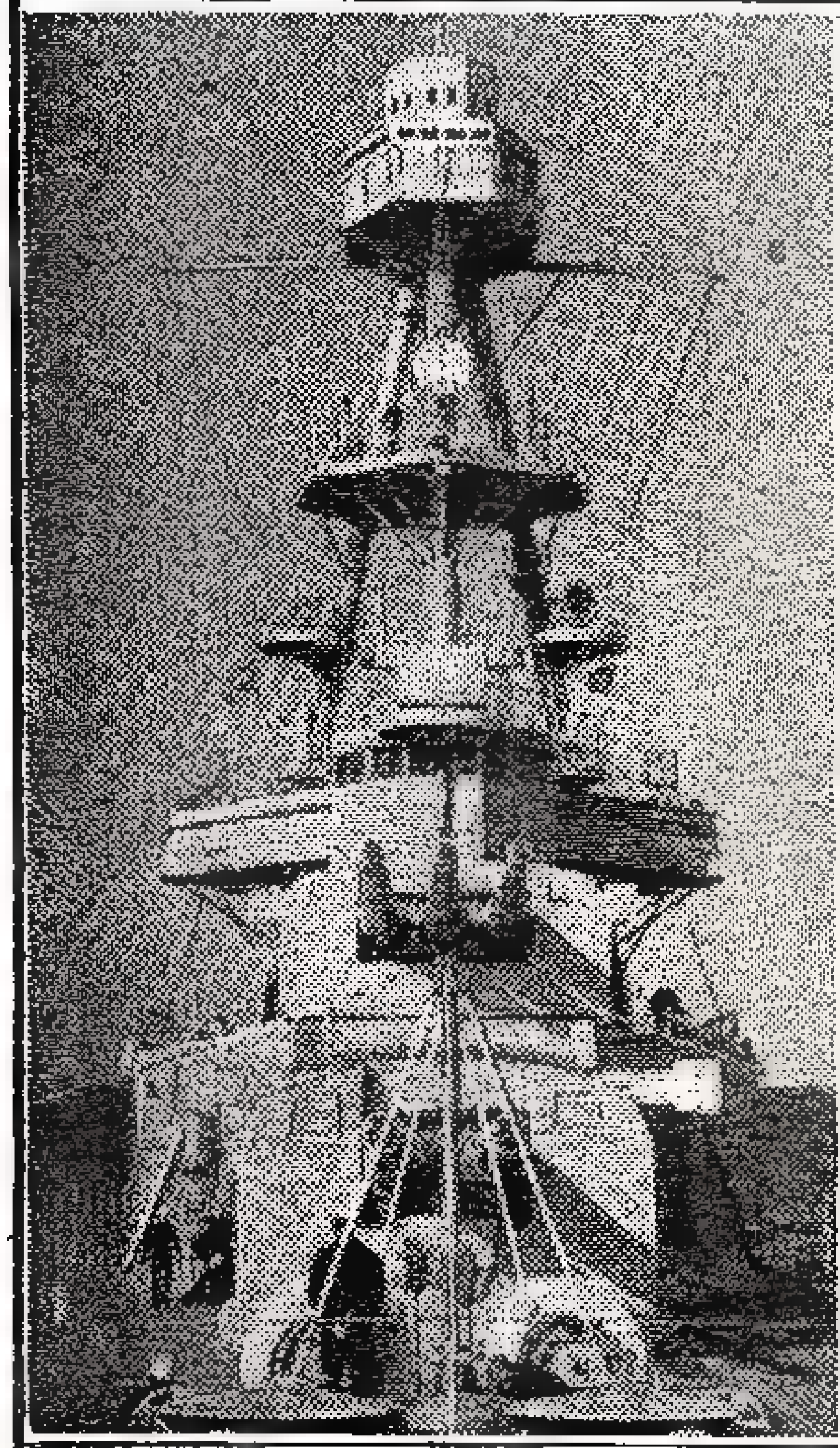


The frontline of defense. The battleships "Texas" and "Idaho" in majestic parade. We need more of these, U. S. navy experts claim.

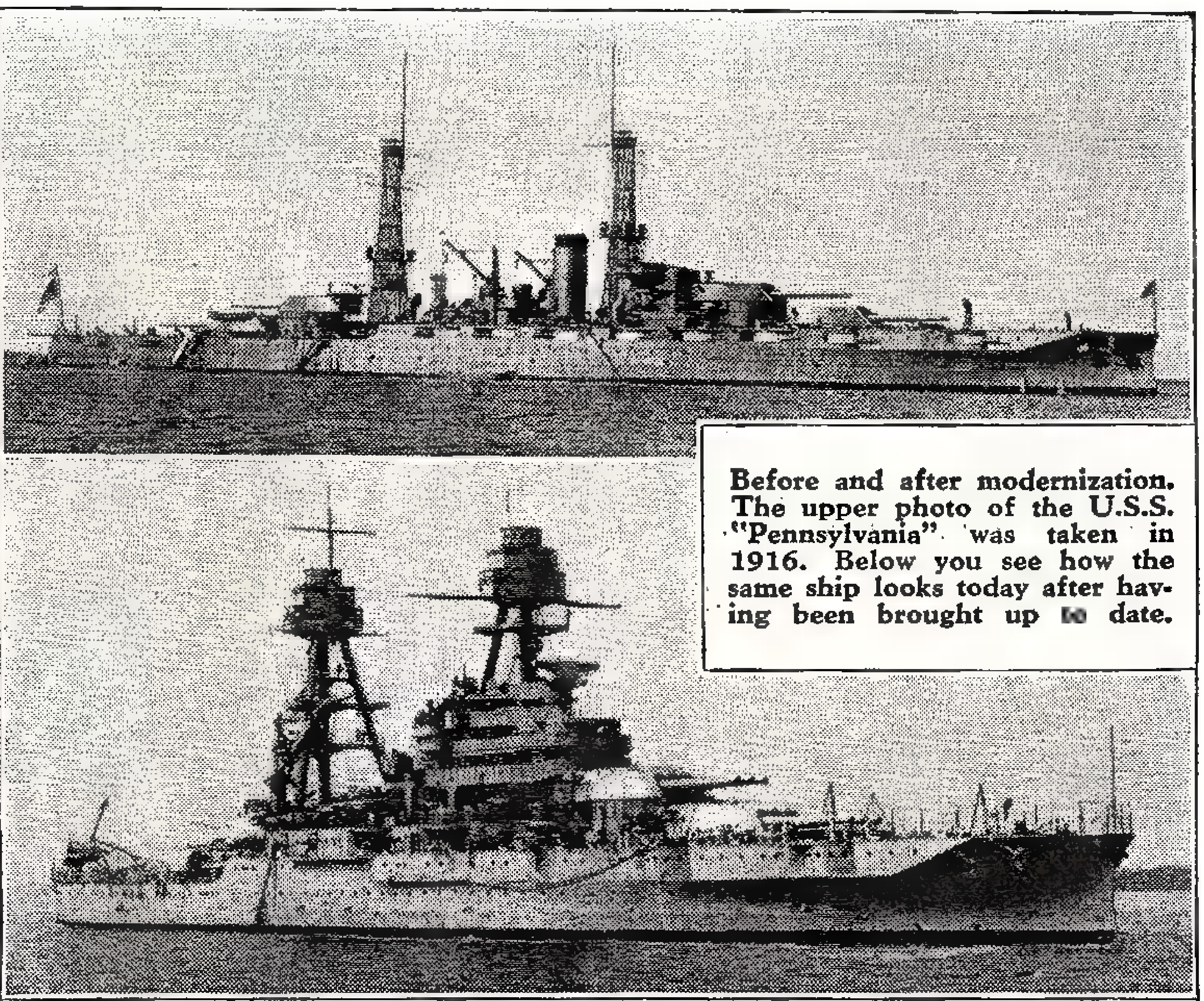


Scores of costly destroyers rusting and rotting at San Diego Naval Base. Allowed to go to ruin, these boats could not be put into condition without huge expenditures.

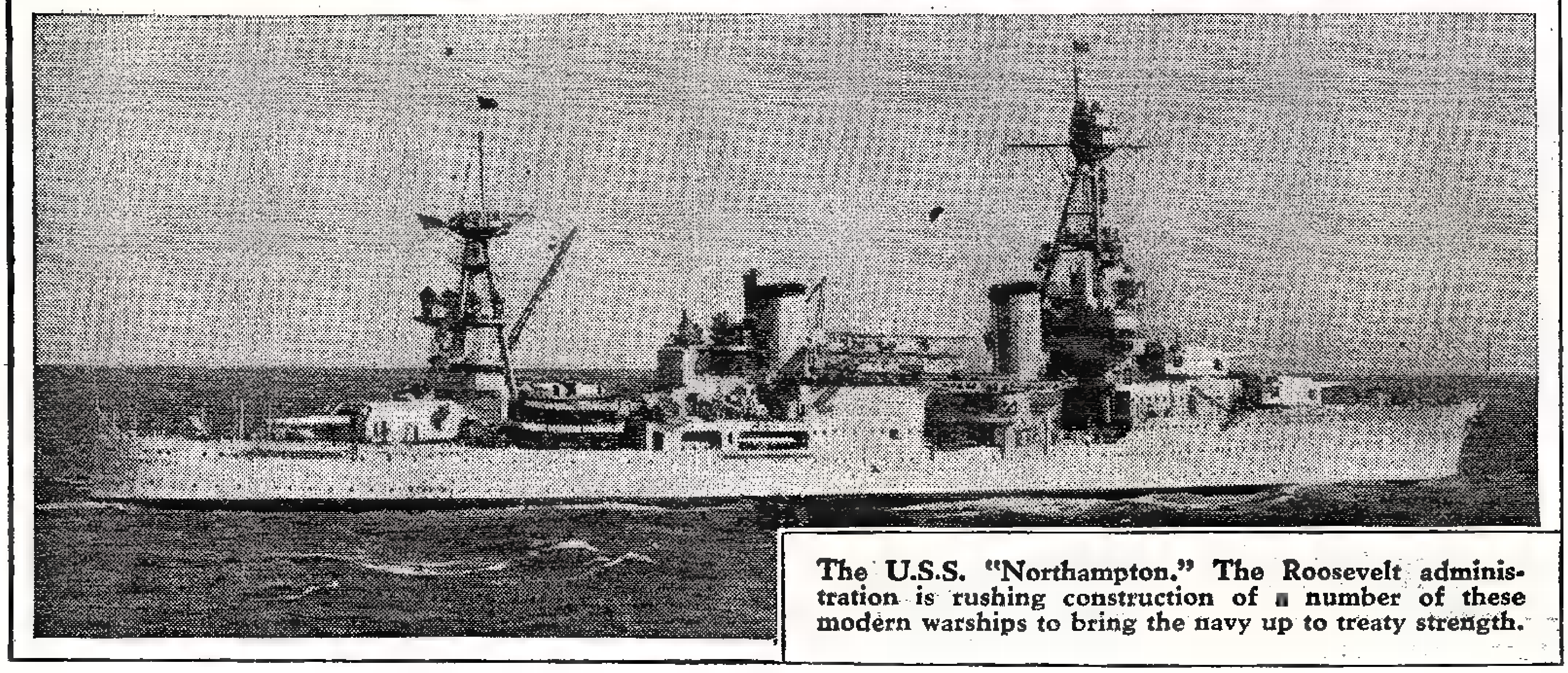
Battleships Which May Some Day Hold the Fate of American Security



Topside deck view aft from bow of U.S.S. "Pensacola," new modern battle cruiser. Note modern tripod mast, with numerous anti-aircraft guns.



Before and after modernization. The upper photo of the U.S.S. "Pennsylvania" was taken in 1916. Below you see how the same ship looks today after having been brought up to date.



The U.S.S. "Northampton." The Roosevelt administration is rushing construction of a number of these modern warships to bring the navy up to treaty strength.

Far East we gave up the fortification and equipment of naval bases west of Hawaii. Simultaneously we scrapped 842,000 tons of new naval construction at an expense of $275,439,275 to the American taxpayers. Included in this were eleven of the finest and most modern men-of-war; seven powerful battleships and four battle cruisers. These ships were building at the time and the average stage of completion was 30 per cent. No other nation made such sacrifices.

Out of the debacle we salvaged two battle cruisers that were 33 per cent complete and cobbled them over into a pair of freak airplane carriers as an alternative to no carriers at all. These ships are the *Lexington* and *Saratoga,* two weak baskets in which we have carried most of the eggs of our naval aviation in recent years. They are makeshift contraptions with guns, smokestacks and superstructures squeezed out of the sides of their flying decks to menace the life of every aviator making a landing or take-off.

Having junked nearly $276,000,000 worth of REAL fighting ships the United States, under the terms of the Washington Treaty, was allowed to spend $76,760,000 for the "modernization" of the fifteen old battleboats we retained. Some of these ships were nearly out of date when the treaty was signed in 1922 and, of course, we have built no battleships since.

A great deal of this battleship "moderni-

(Continued on page 126)

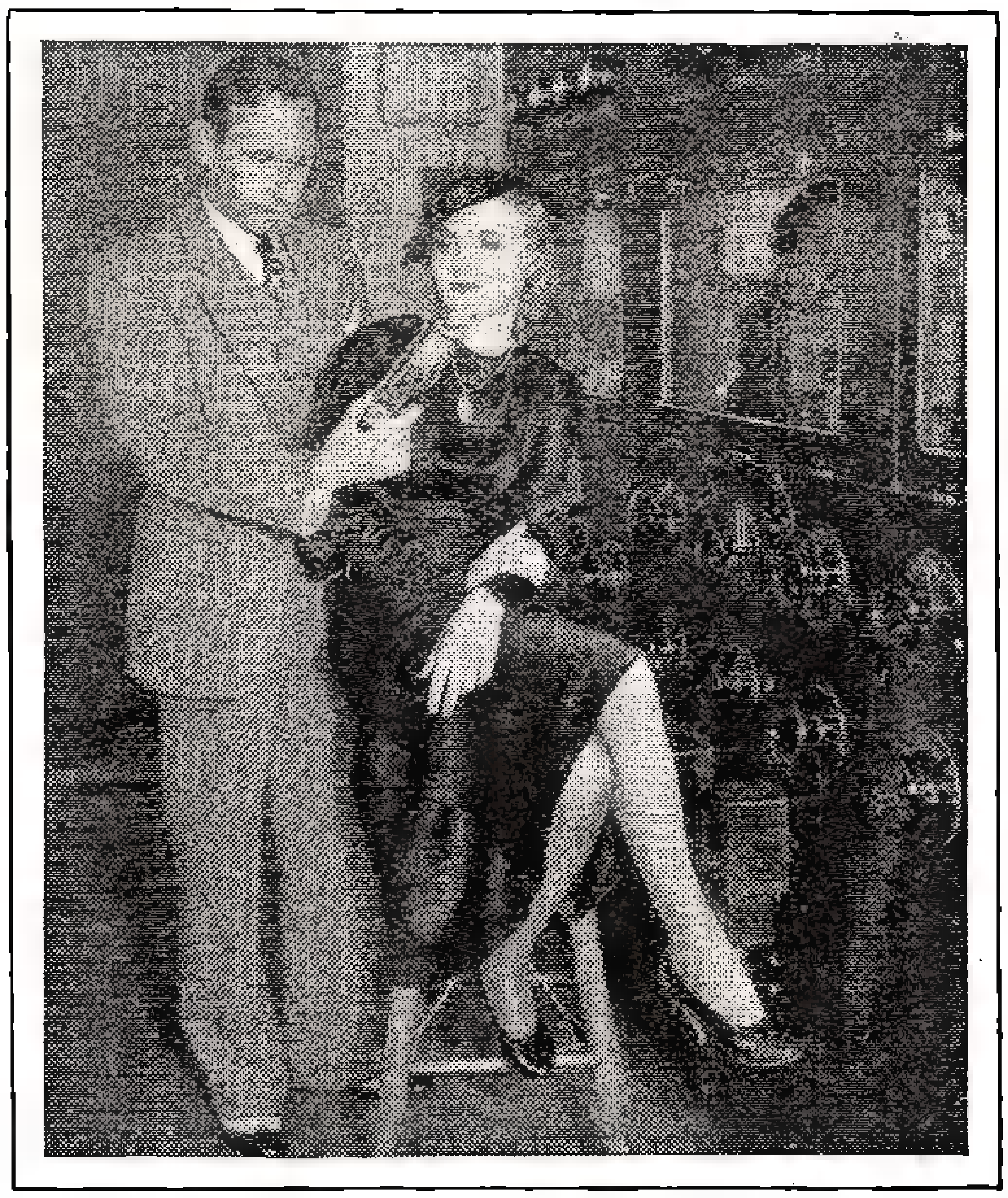
Motion Pictures Feature of Latest Television Programs

DAILY television programs featuring full length motion picture productions and assorted short features, such as comedies, animated cartoons, travelogues and newsreels, are being enjoyed by television enthusiasts in and near Los Angeles.

The motion picture programs are presented daily by W6XS and W6SAO, stations operated by the Don Lee broadcasting organizations. The television transmitters operate on an experimental license issued by the Federal Radio Commission.

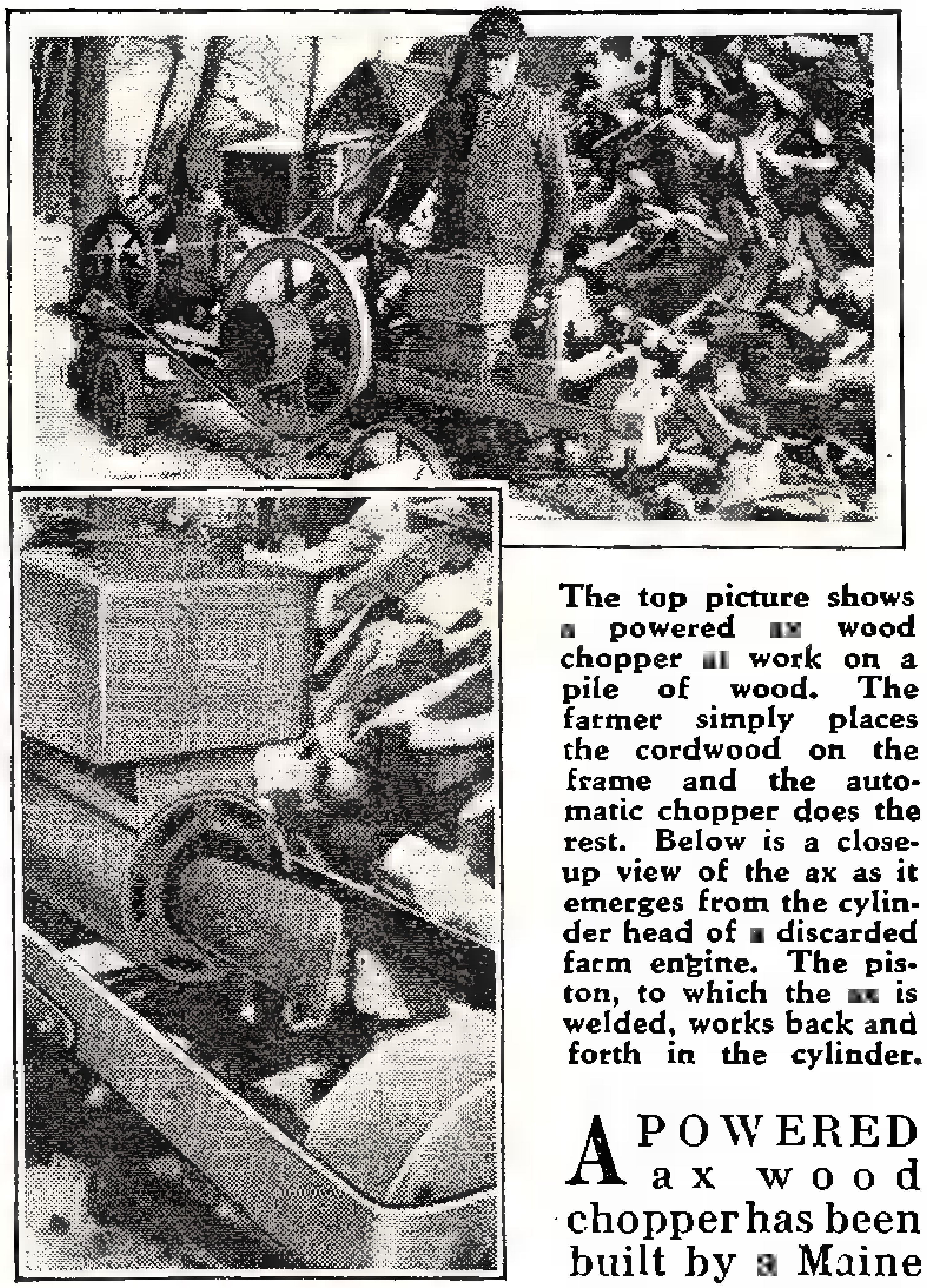
Thousands of radio enthusiasts are now showing great interest in television and the programs from W6XS and W6SAO are received daily on a great many stations within 55 or 60 miles of the transmitters.

Many of these amateur television followers are making substantial contributions toward the improvement of receiving apparatus. At the present time the pictures are coarse and somewhat "foggy," but constant developments point to practical use of television within a short time.



Verna Hillie, film actress, learns about television movies from Harry R. Lubcke, engineer. The tube which Lubcke is holding plays an important part in television broadcasts.

Powered Ax Chops Farmer's Wood



The top picture shows a powered ax wood chopper at work on a pile of wood. The farmer simply places the cordwood on the frame and the automatic chopper does the rest. Below is a close-up view of the ax as it emerges from the cylinder head of a discarded farm engine. The piston, to which the ax is welded, works back and forth in the cylinder.

A POWERED ax wood chopper has been built by a Maine farmer from a discarded gasoline engine.

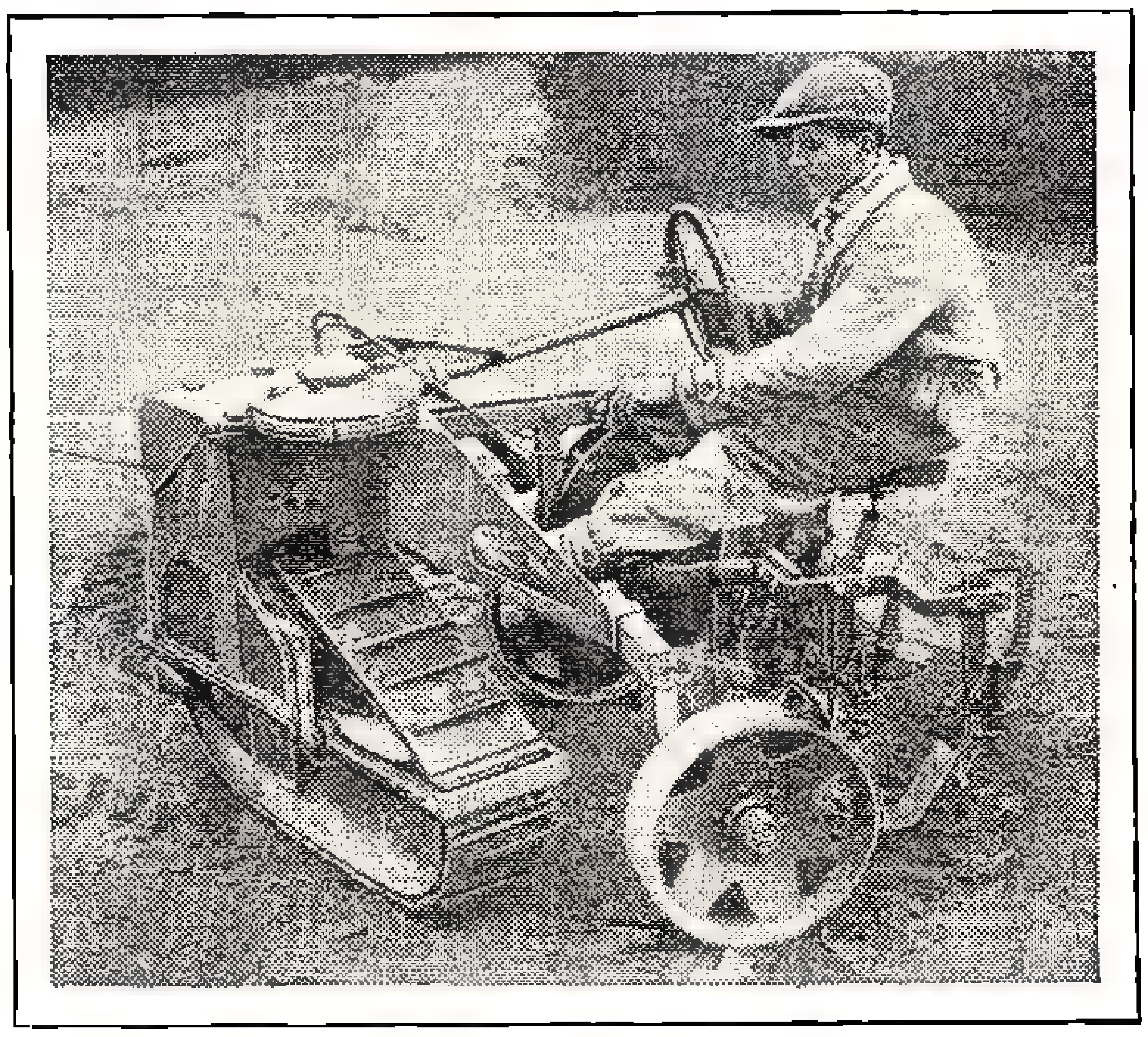
Taking the cylinder head off, he welded an ax to the piston and turned the engine into a first class wood chopper. The erstwhile motor is turned over by a small gasoline engine.

Italian Perfects Smallest Tractor

WHAT is believed to be the world's smallest practical tractor has been perfected by Professor Ferraguti, of Rome.

The tractor, working on the caterpillar principle, has a five horse power motor of only one cylinder.

The tiny tractor is very useful on small farms and in land where there are many trees. It can be pivoted on one wheel and can make a complete turn in five feet of space.



This baby tractor, powered by a five-horse power motor and operated on the caterpillar principle, has been developed in Italy. It is very useful on small farms and in thickly wooded places, for it needs but a 5 ft. road to turn in.

Energetic Charwoman Rides Motorcycle Seeking Business

THE TRAVELLING CHAR
STOP ME
for
CLEANING

This unusual means of advertising her work was devised by an English charwoman. She rides about in the vehicle and people who want her services simply call out to her.

THE advertising charwoman has made her appearance upon the streets of London.

Determined to build up her clientele, this energetic worker purchased a cheap second hand motorcycle with a large delivery-type sidecar. She rides about the city, dressed in her scrubbing clothes. In the sidecar, well displayed, are her mops, brushes, brooms and ladder. On the sides of the car, she has a sign proclaiming her as "The Travelling Char" and inviting prospective customers to stop her.

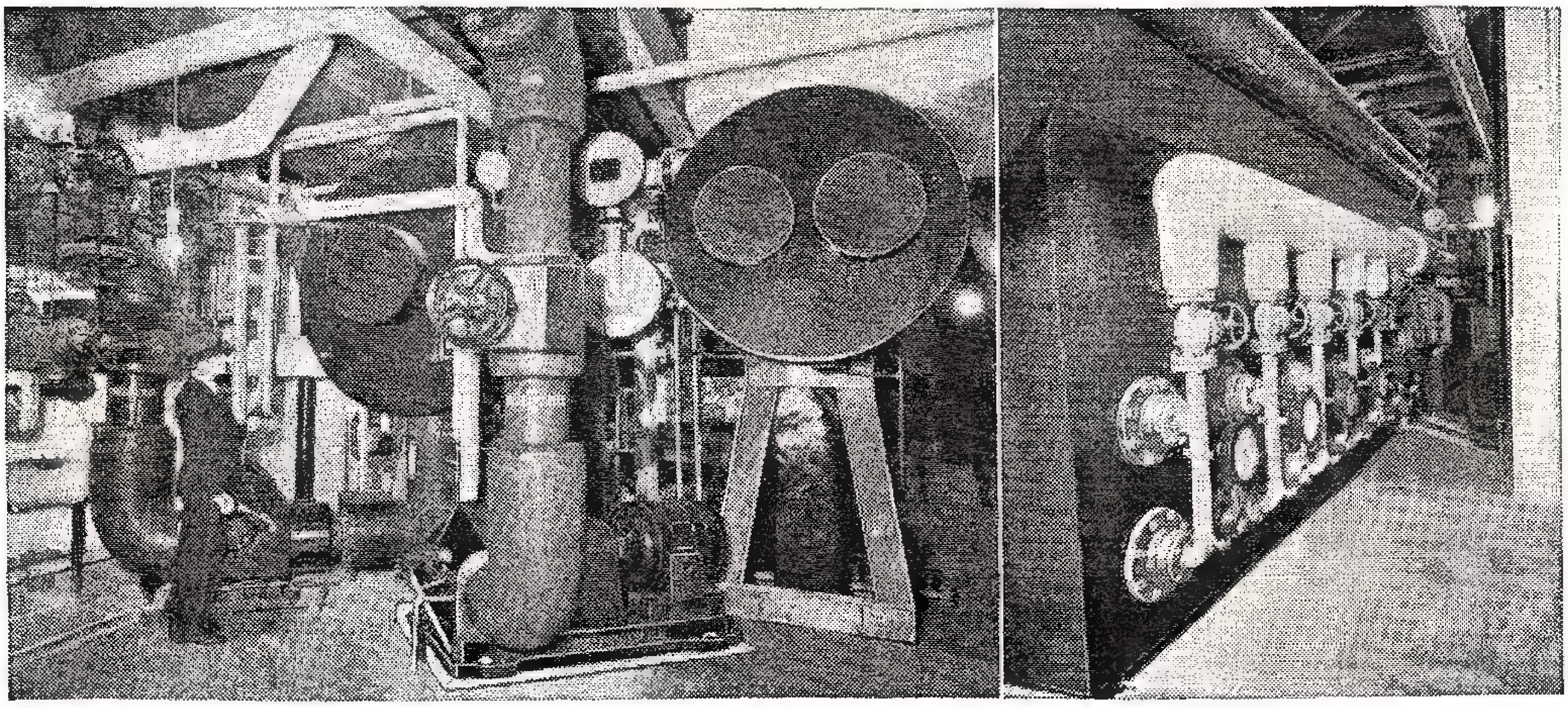
This woman reports that the novel means of advertising has brought her a splendid increase in income.

Skyscrapers Cooled With Steam

HIGH pressure steam is actually being used in two of the ultra-modern buildings of Rockefeller Center, New York City, to provide cool air. This is a reversal of the usual work of scalding steam.

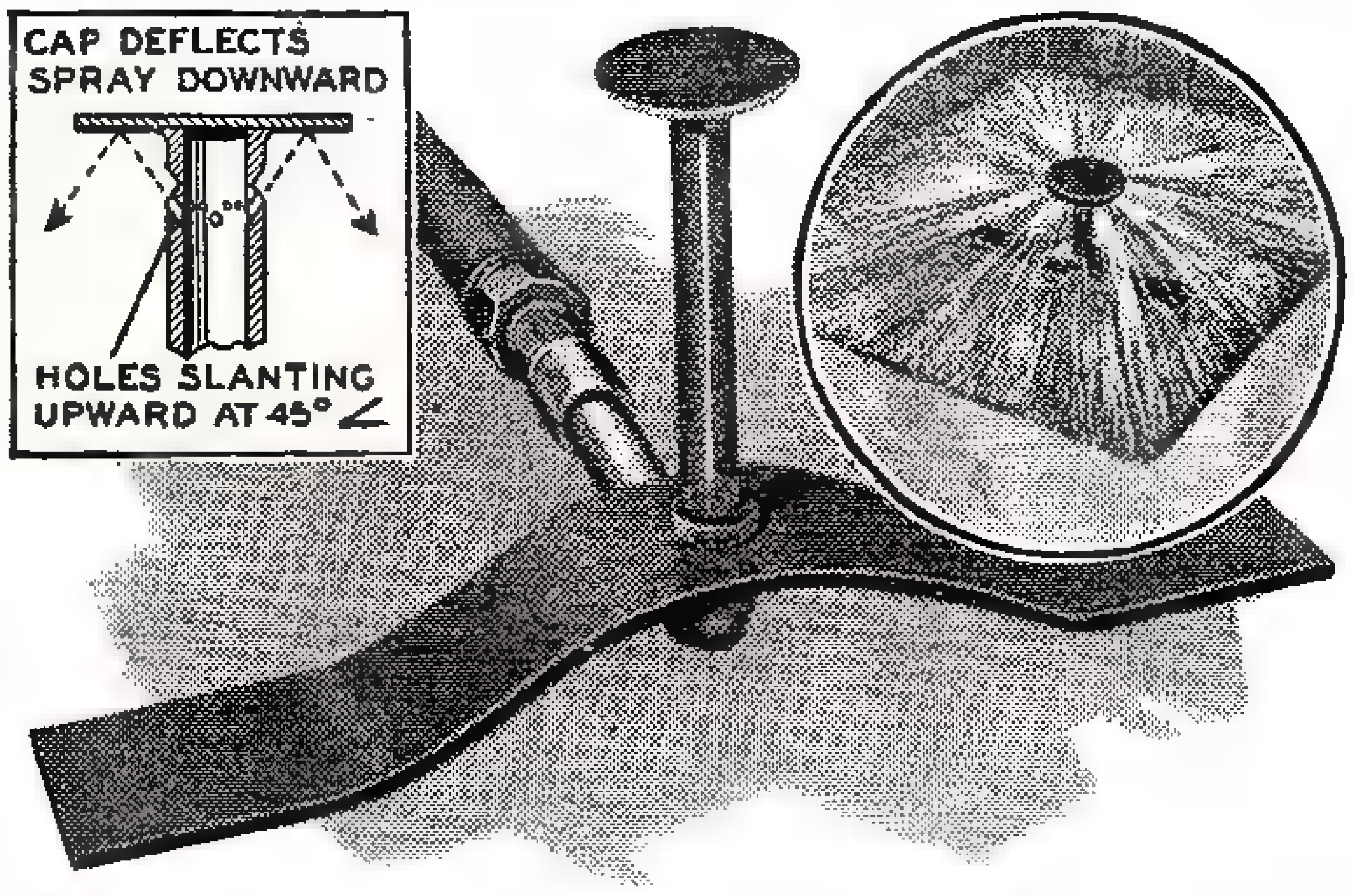
The steam cooling units are built to provide an abundance of cold air whenever needed. They will deliver the equivalent of 1,360,000 pounds of artificial ice.

The system operates on the theory that water cools when placed in a vacuum. The water in reality boils, thus giving up its excess heat in vapor form. Steam, escaping from a jet at terrific speed, produces the necessary vacuum for removing heat from the cooling water.



Two views of novel new refrigeration plant installed in Rockefeller Center, New York City. Steam, permitted to escape very rapidly from a jet, creates a vacuum which absorbs heat from water in the gigantic cooling system.

Lawn Sprinkler Covers Square

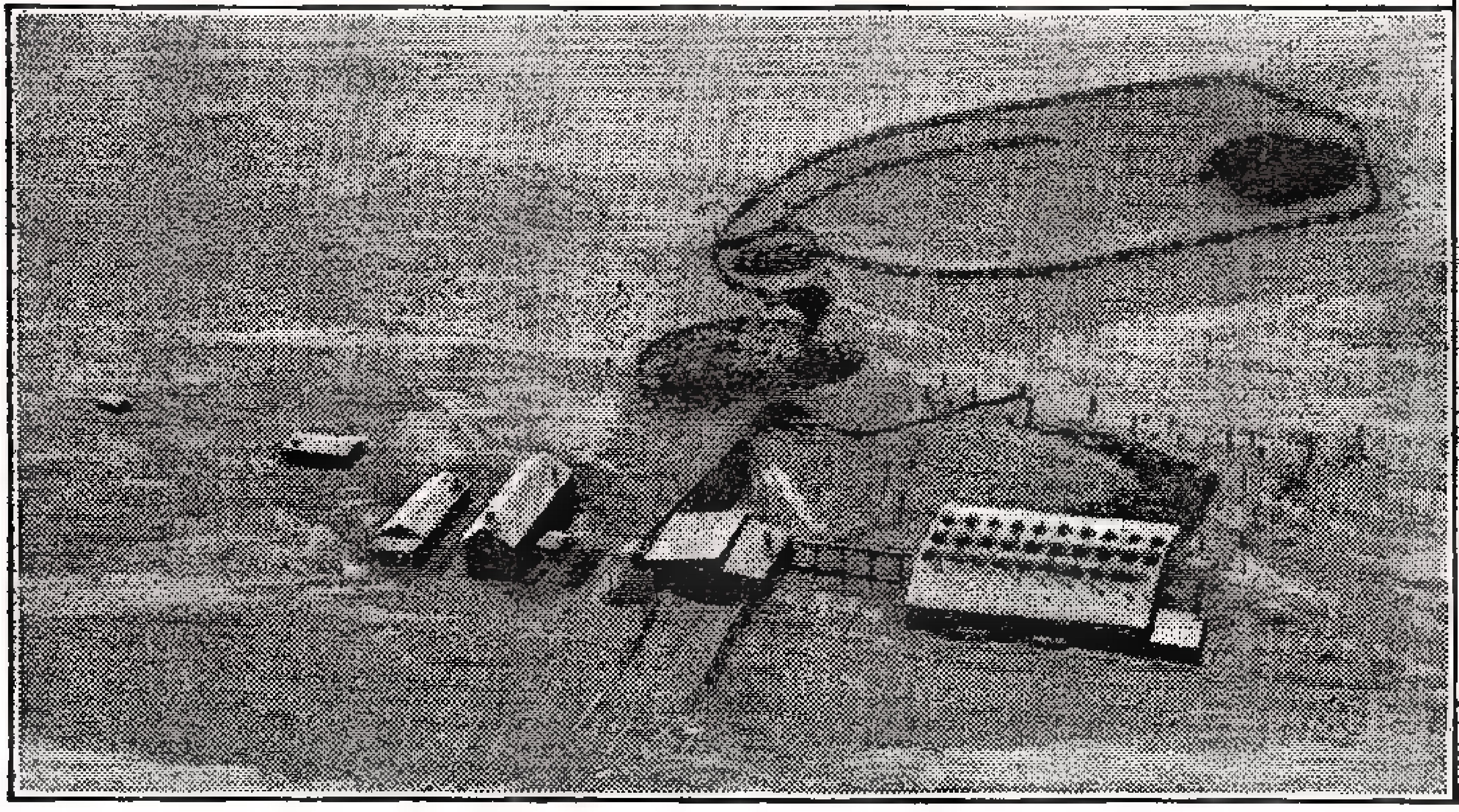


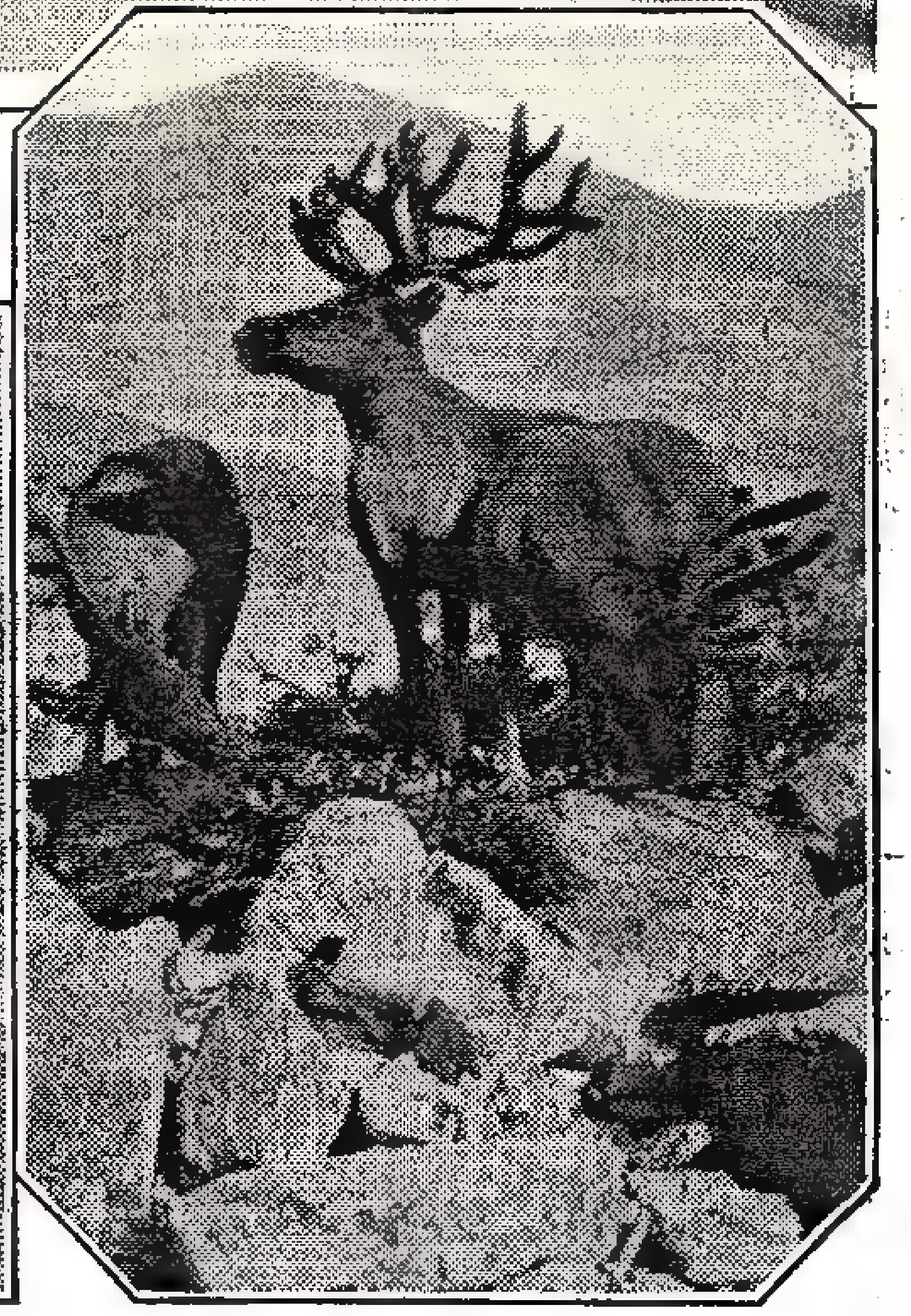
Sprinkler nozzle throws square of water over 18-ft. area.

A NEW lawn sprinkling nozzle now on the market is so constructed that water is thrown in a square of any size up to 18 feet across. Along sidewalks pedestrians do not get their shoes and clothes wet while passing. The illustrations above show how this remarkable control is accomplished. A saving of one-third is made in water consumption, it is claimed by the inventor.

200,000 Reindeer Roam Alaskan Ranch

This is the way Alaskan reindeer raisers "ride herd." At right is Al Lomen, Nome, Alaska, setting out on a tour of inspection behind a team of reindeer.





Reindeer raising has become a major Alaskan industry through the efforts of the Lomen Brothers, who in 1914 organized the corporation that bears their name. Their herds number 200,000 head, and are tended by Laps and Eskimos who at certain seasons of the year drive them to corrals such as the one shown above. It is located at Elephant Point on Kotzebue Sound, where deer are killed and packed. Right: Reindeer forage for themselves, are hardy, easily raised.

ALASKAN reindeer raising has assumed big business proportions through the efforts of the Lomen family, who in 1914 went to Alaska, purchased a small herd of 1200 head, and now have a far flung enterprise employing special ships, special slaughter houses, and a herd of 200,000 head and over.

Nome, Alaska, is headquarters for this distinctly new and distinctly Alaskan industry. A new cattle raising romance like that of the old west bids fair to grow out of the reindeer raising business, for instead of galloping cowboys, Eskimos who mush their way through dense forest and across frozen tundra behind dog teams are the heroes of these new sagas.

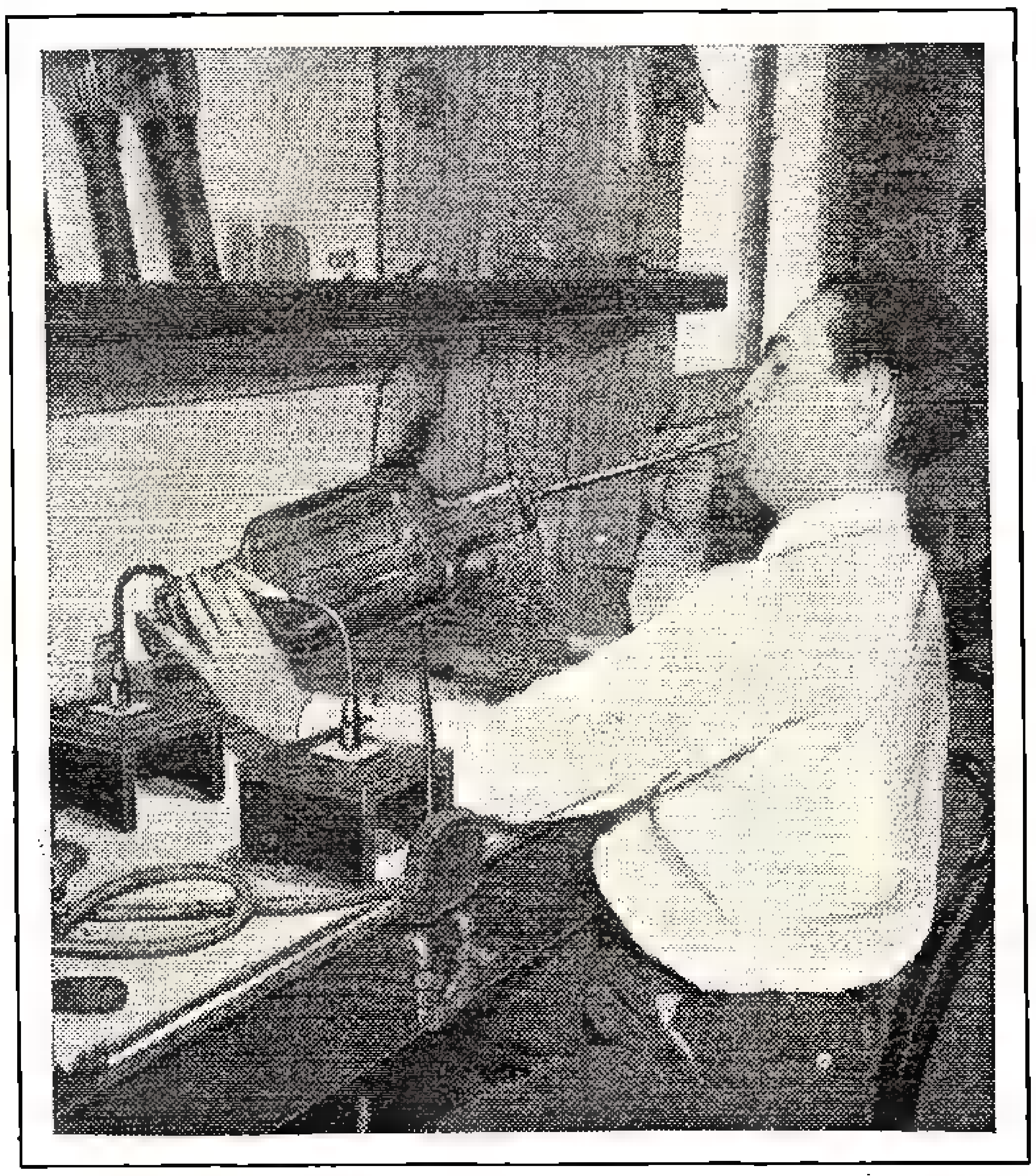
The Lomens started with 1200 head purchased from Laps, who for centuries have domesticated the reindeer until it has become a comparatively easy animal to raise. The reindeer, unlike the caribou, is as easy to herd as sheep, and the Lomens found the animal took readily to Alaskan rigors. The first season they shipped out 74 carcasses—and had a hard time selling them.

They persevered, built their own corrals and slaughter houses, notably the one at Elephant Point on Kotzebue Sound, and now have an investment of over $2,500,000 in an industry which raises a product finding an increasingly popular market.

Eskimo herders are given charge of flocks. Their pay ranges from $1200 to $1500 per year, and they are provisioned by the company. They herd their reindeer throughout a season, returning them from their wanderings to the corral every fall. The scene is not unlike that of the roundups which made the old west famous. The increase is carefully tallied and the business of cutting out the market animals begins. Only the steers, however, and a small percentage of the old does are killed.

Meat is dressed and stored in natural caverns, where nature does the freezing until the company's ships call for loading.

Unusual Ability to Repair Radio Tubes Brings Big Income



Richard H. Seaman is shown above in his California laboratory, where he renews the life of expensive radio tubes.

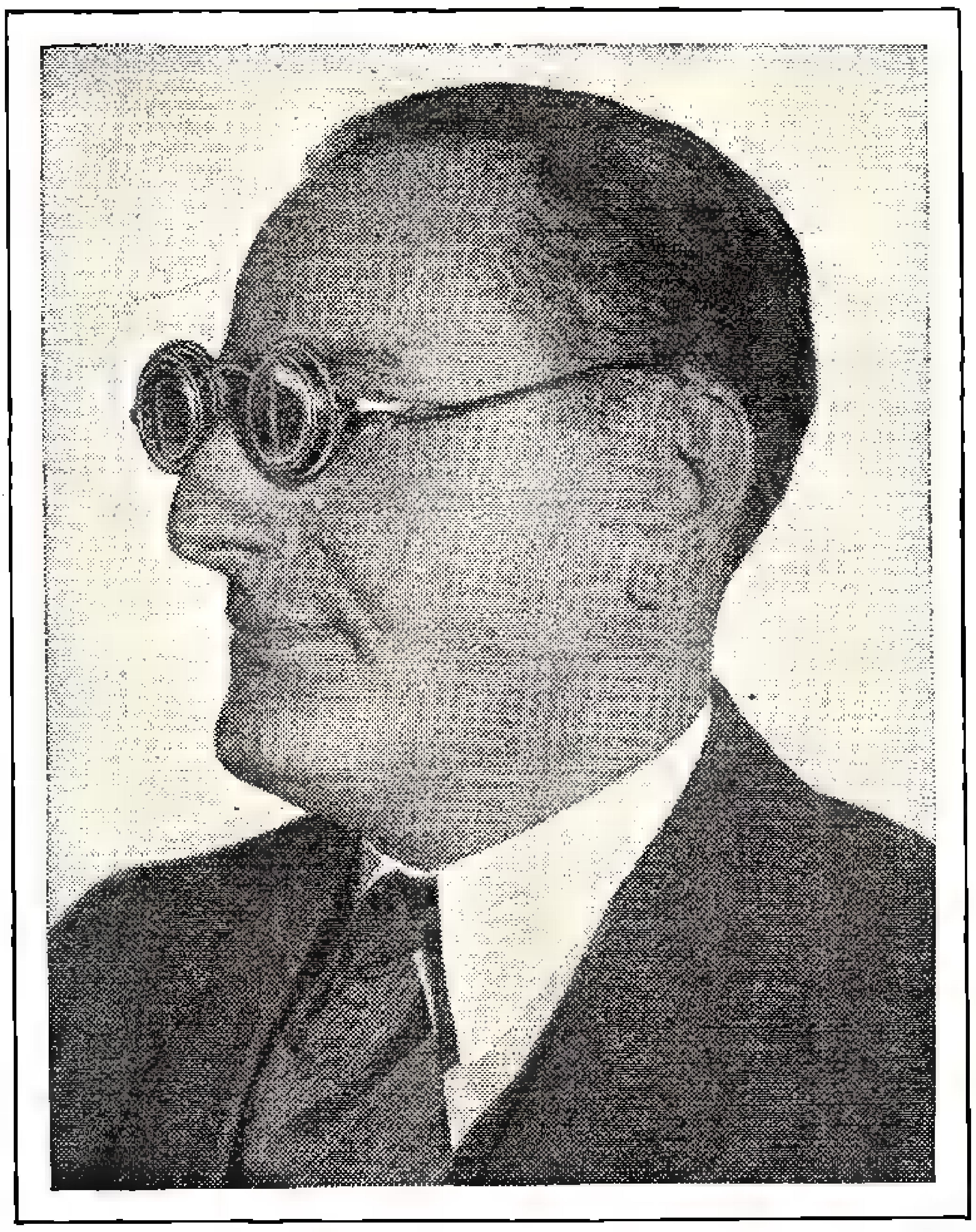
RICHARD H. SEAMAN of Alhambra, California, is really a specialist. As one of the few radio tube repairmen in America, he is kept very busy bringing back to usefulness burned out transmitting tubes. The tube problem is of prime financial importance to any broadcast station.

Seaman first opens the tubes to replace the burned out filament and clean up the electrodes. The opening and sealing processes are done with blow torches, great care being taken to heat the glass slowly. In many instances a terrific heat must be produced to soften the hard quartz glass.

The sealing-in operation is very delicate, since the slightest slip of the hand or a bit too much pressure would ruin the tube.

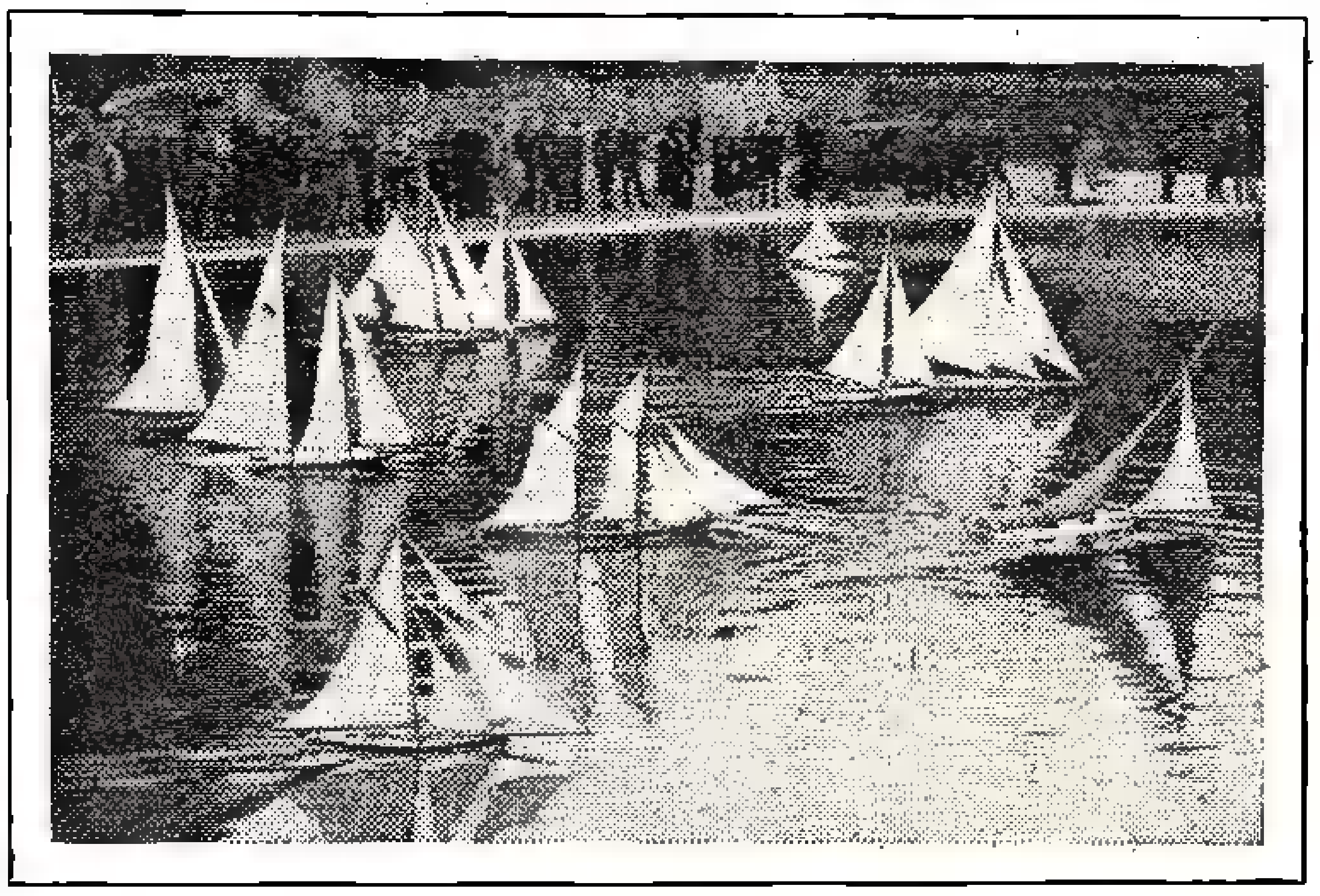
Glasses Magnify Eighteen Times

NEW microscopic reading glasses, so powerful that they increase the size of ordinary newsprint eighteen times, have been invented by Dr. William Feinbloom of New York. These glasses are three times more powerful than anything of the kind previously known.



Dr. William Feinbloom, of New York, is pictured wearing his new type glasses, which magnify objects eighteen times.

Miniature Boat Racing Popular



Boat racing is now a popular Sunday morning sport in France. Picture shows miniature boats on a pool in Paris.

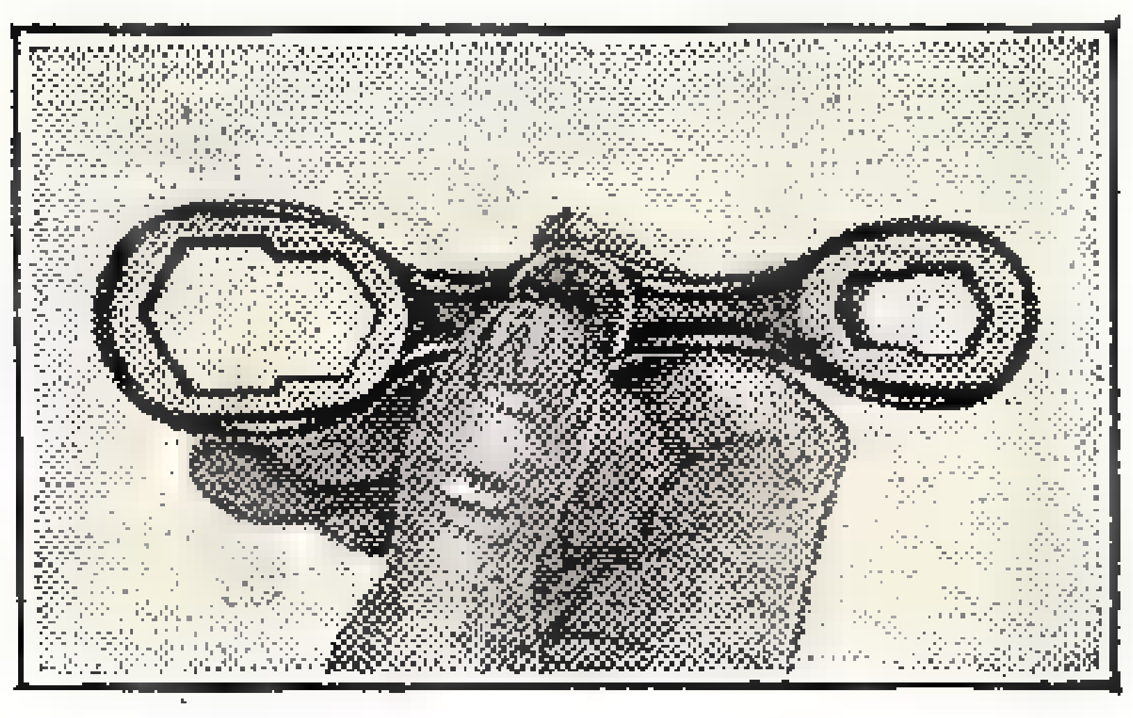
MINIATURE boat racing, long a popular sport for youngsters and adults in many American cities, has spread to France.

Races are now held quite frequently in the historic fountain pool of the Tuileries Gardens, in Paris.

This sport has awakened much interest in the art of model boat making and many fine specimens of sailing and motored models, the latter usually propelled by electric energy, are frequently seen.

Wrench Fits Many Sizes of Nuts

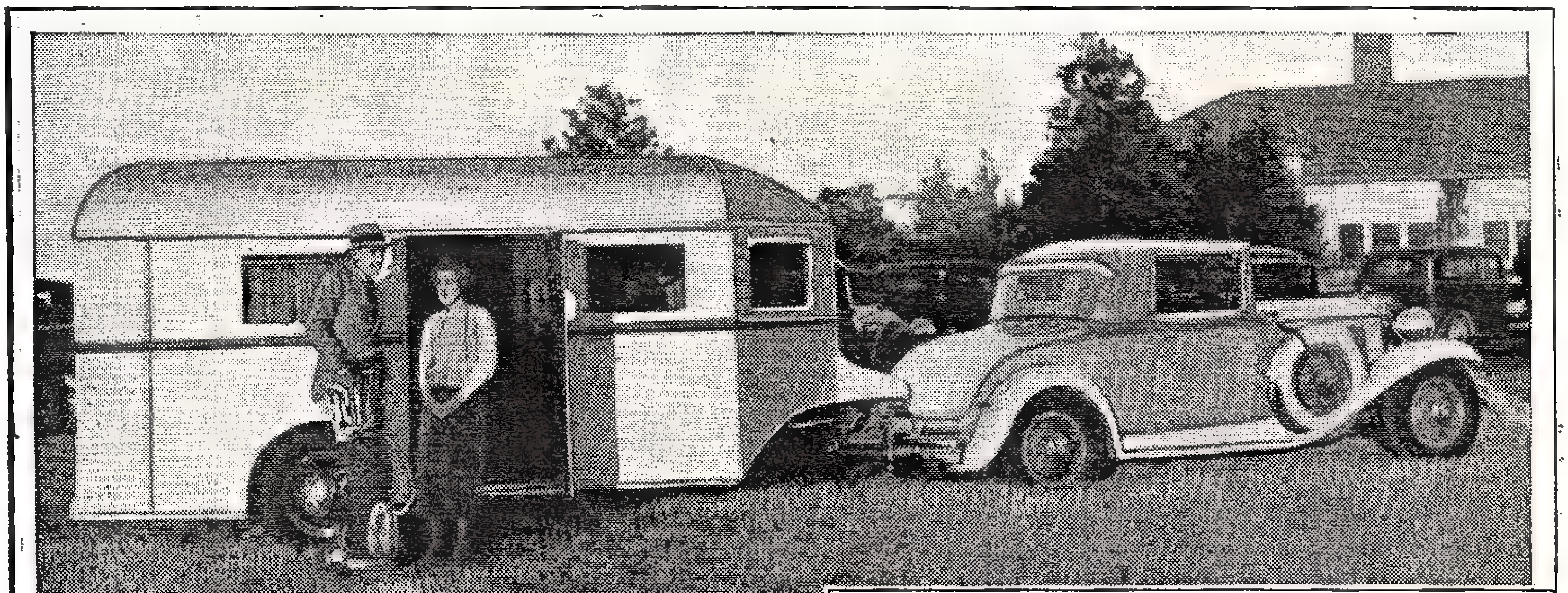
A NEW "fit-all" wrench, recently invented and made available for general use, is particularly appealing around the house.



This wrench handles eight sizes of hexagon nuts or bolts without requiring any adjustment. Outstanding feature is its size.

This wrench, without adjustment of any kind, fits eight sizes of hexagon nuts or bolts and by approximate fit can be utilized to tighten or loosen both hexagon and square.

Noted Golf Pro Enjoys Home Comforts in Auto Trailer



All ready to go anywhere. Mr. and Mrs. Roland Mackenzie simply attach this little home on wheels to the rear of their coupe and start out. It is roomy and comfortable.

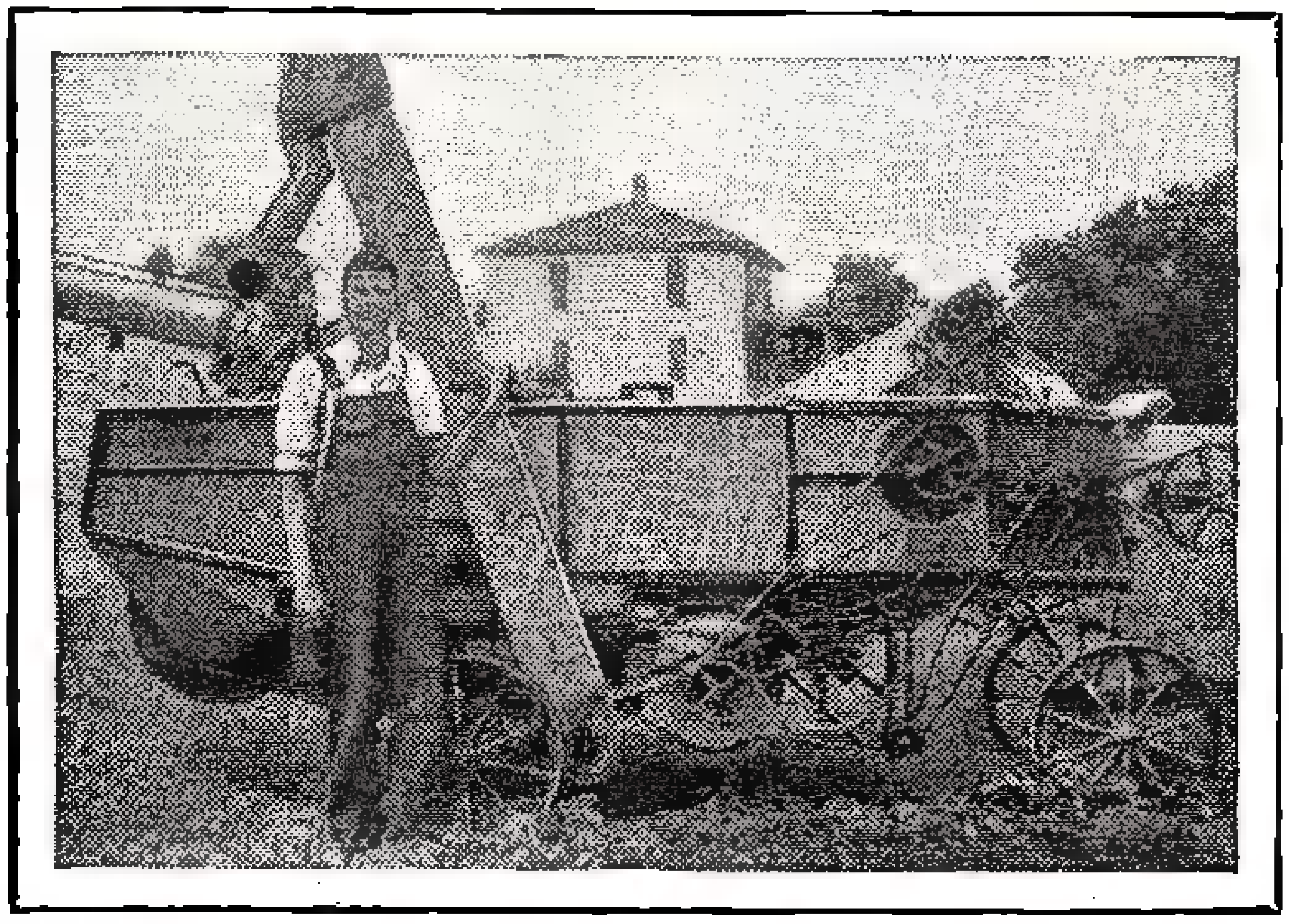
ROLAND MACKENZIE, former amateur golf star who recently turned pro and started to tour the country for tournament play, has solved his housing problem.

He outfitted a trailer which has all the comforts of home and with Mrs. Mackenzie is really enjoying travelling.

The appointments and equipment of the trailer are so complete that Mr. and Mrs. Mackenzie frequently entertain friends in their home on wheels.

Home-made Thresher Costs $50

FACED with the problem of high cost in harvesting small grains, Martin Kyhn decided to build a home made threshing machine. He made it from parts of mowing machines, binders, plows, wagons, corn threshers, tractors and household appliances. It took him five years to build, but only cost $50. It is powered with a tractor which he also built at home out of an old Ford model T roadster. It operates fast enough to keep two bundle wagons busy.



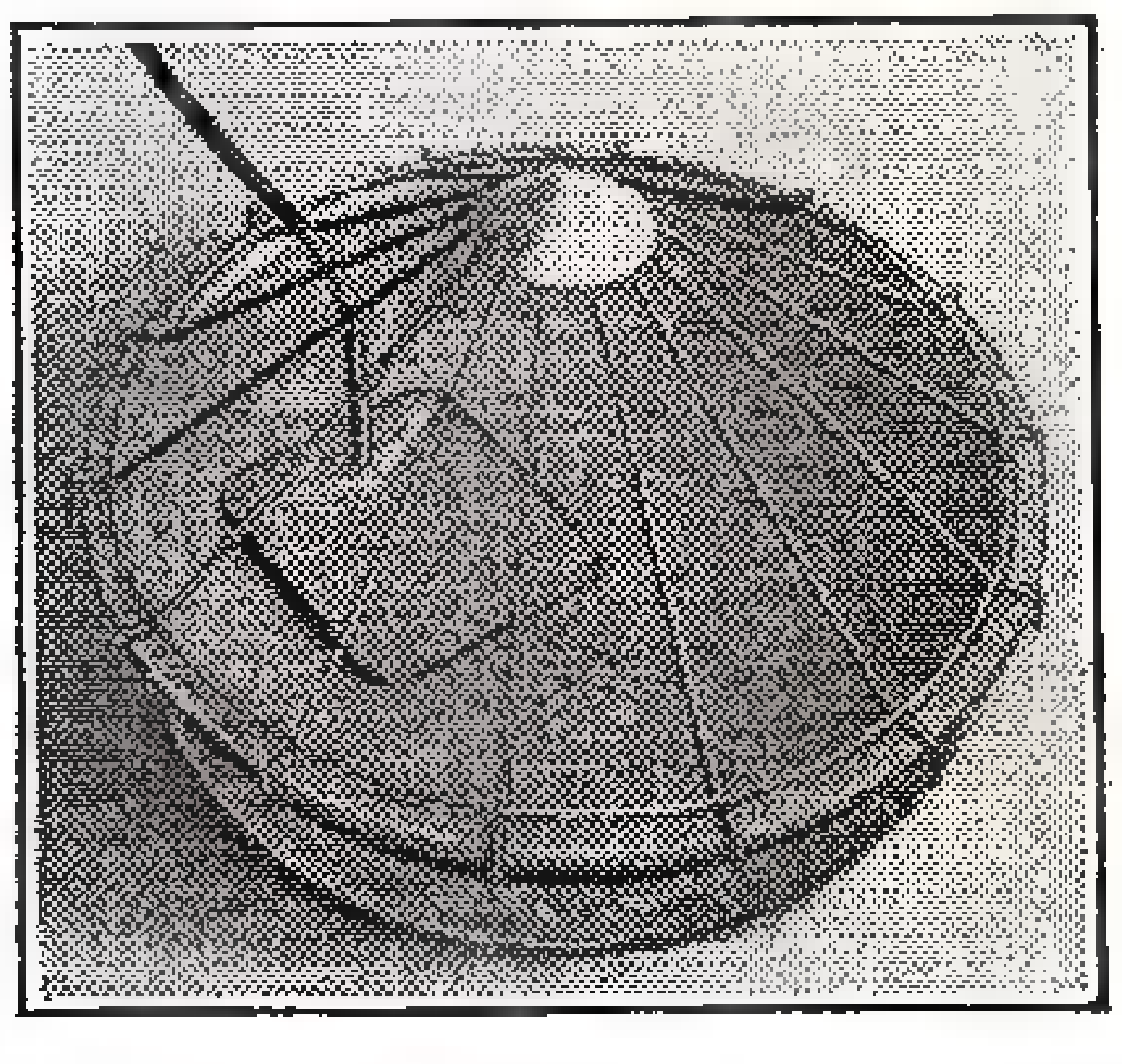
This complete threshing machine cost its owner only $50. He made it out of parts from various kinds of machines.

Everything is handy in this novel residence trailer. Mrs. Mackenzie finds it no trouble at all to prepare meals.

Electricity Heats Poultry Fountains

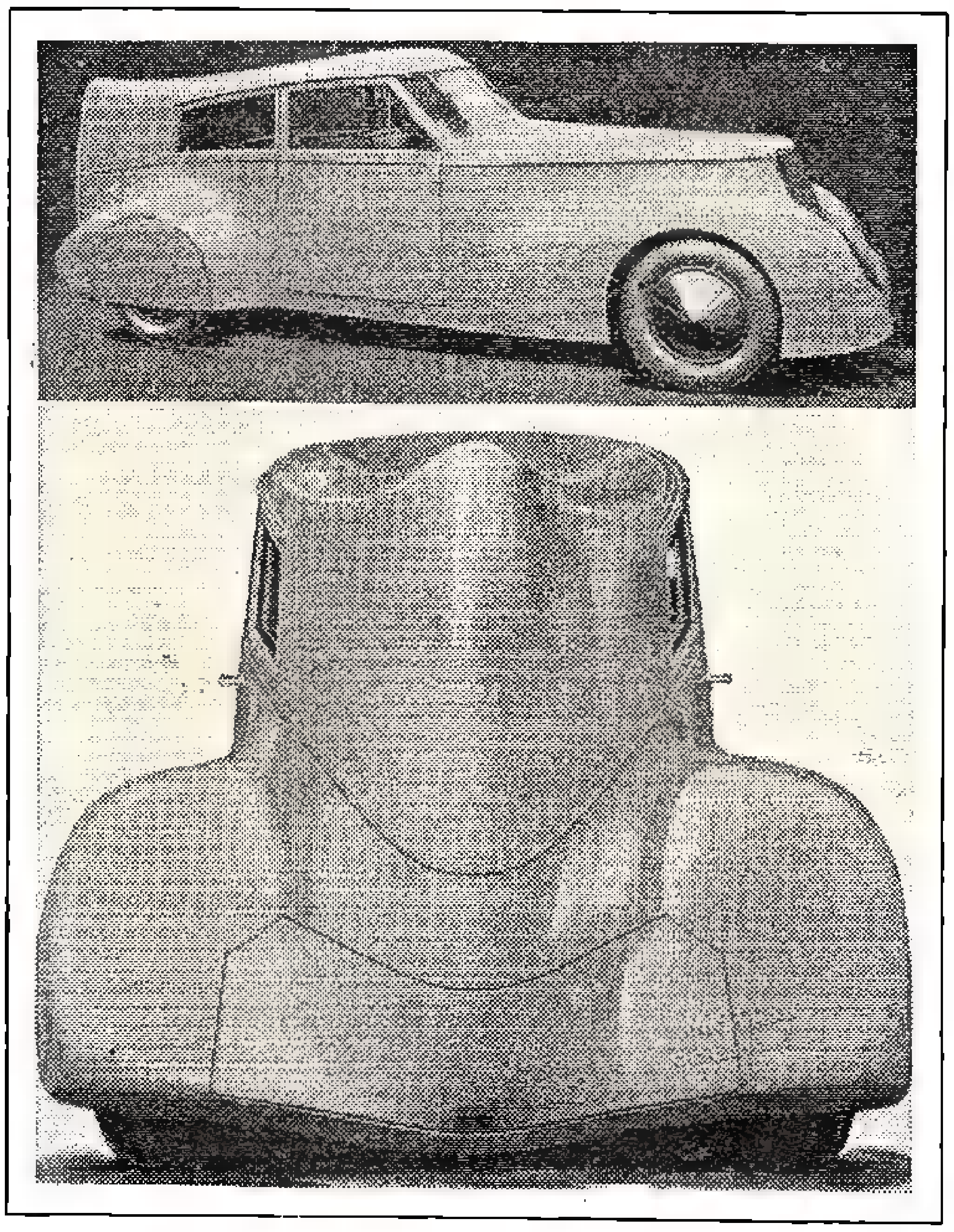
PHOTOGRAPHERS, chicken raisers and others who must keep water at a specified temperature in all weather conditions are interested in a new electric automatic water warmer. It consists of an electrically heated copper plate. When submerged it is regulated by a thermostat. The heater's copper shell has a tinned surface to prevent contamination.

Tests have shown the apparatus can supply ample heat to prevent a pan of water from freezing at a temperature of 15° below zero.



There are a great many uses for this new automatic water heater. Here it is placed in a pan from which chickens drink.

European Car Forecasts Trend in Streamlined Automobile



This is the latest European contribution to automotive streamlining and forecasts the probable trend in American cars. Lower photo shows radical change in rear design.

MORE radical departures from previous standards can be seen in the latest European automobiles. The extreme, yet graceful, streamline bodies of foreign cars shows the trend American automobiles may follow next year.

Perhaps the most radical of all is the latest model exhibited by the manufacturers of the Mistral, a popular French make.

This car follows very strict aerodynamic lines and is said to offer the very least air resistance when in motion.

The front fenders are huge affairs in which the headlights are embedded.

The body design has a very sweeping effect and the top slopes to the rear, which is almost a complete departure from former European and American ideas.

Despite the fact that so much attention has been paid to exterior design, it is pointed out that this new model provides many new comforts within. There is also room for storage of spare tires, gasoline and tools.

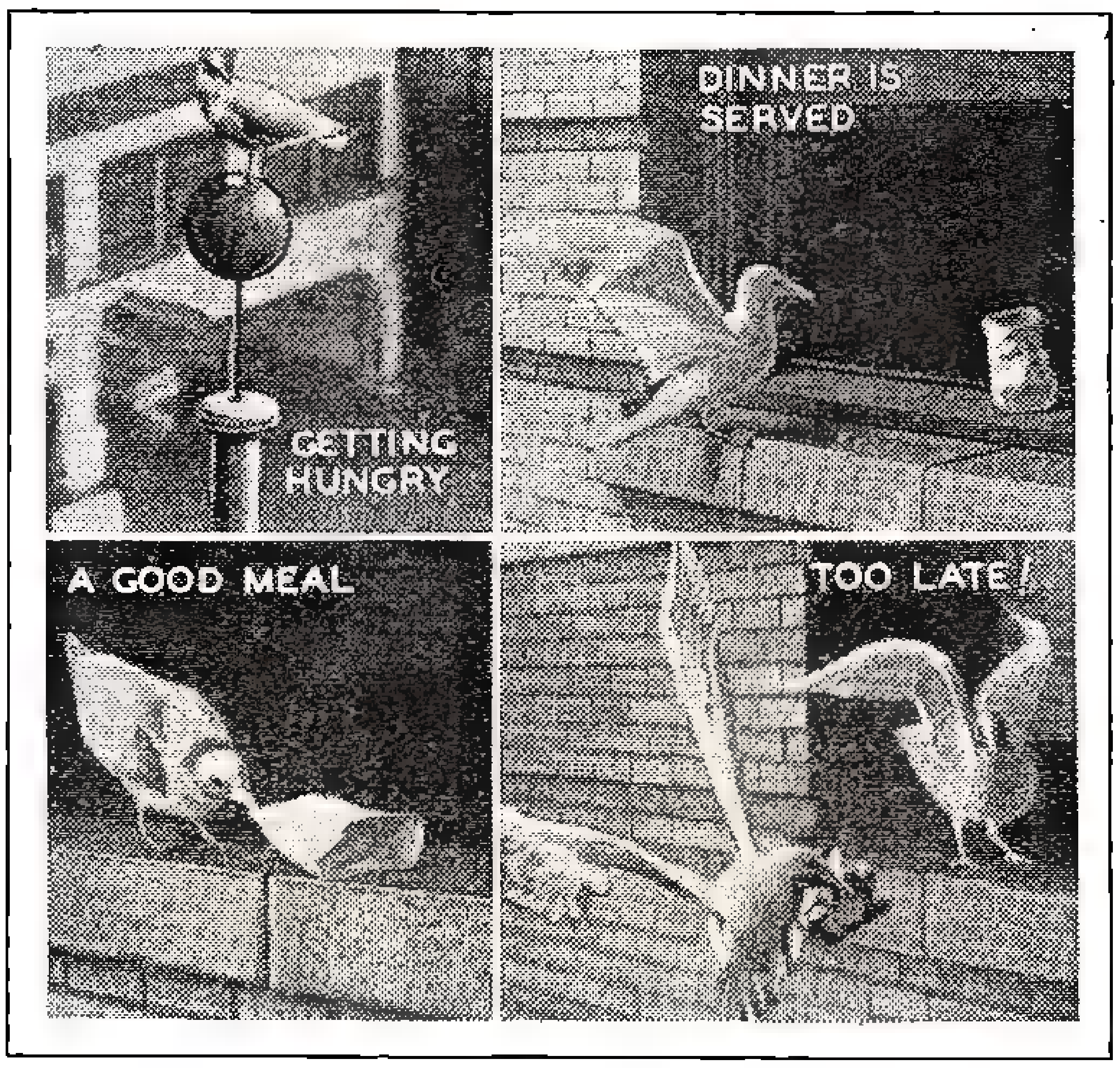
Engineers explain that each curve and sweep has been carefully planned to cut wind resistance down to the very minimum, making for ease in driving and economy in operation.

American automotive engineers are keeping a careful watch on the success of the new design, realizing that the recent trend of models will require the greatest efficiency and beauty from streamlining.

Sea Gull Lunches Daily at Office

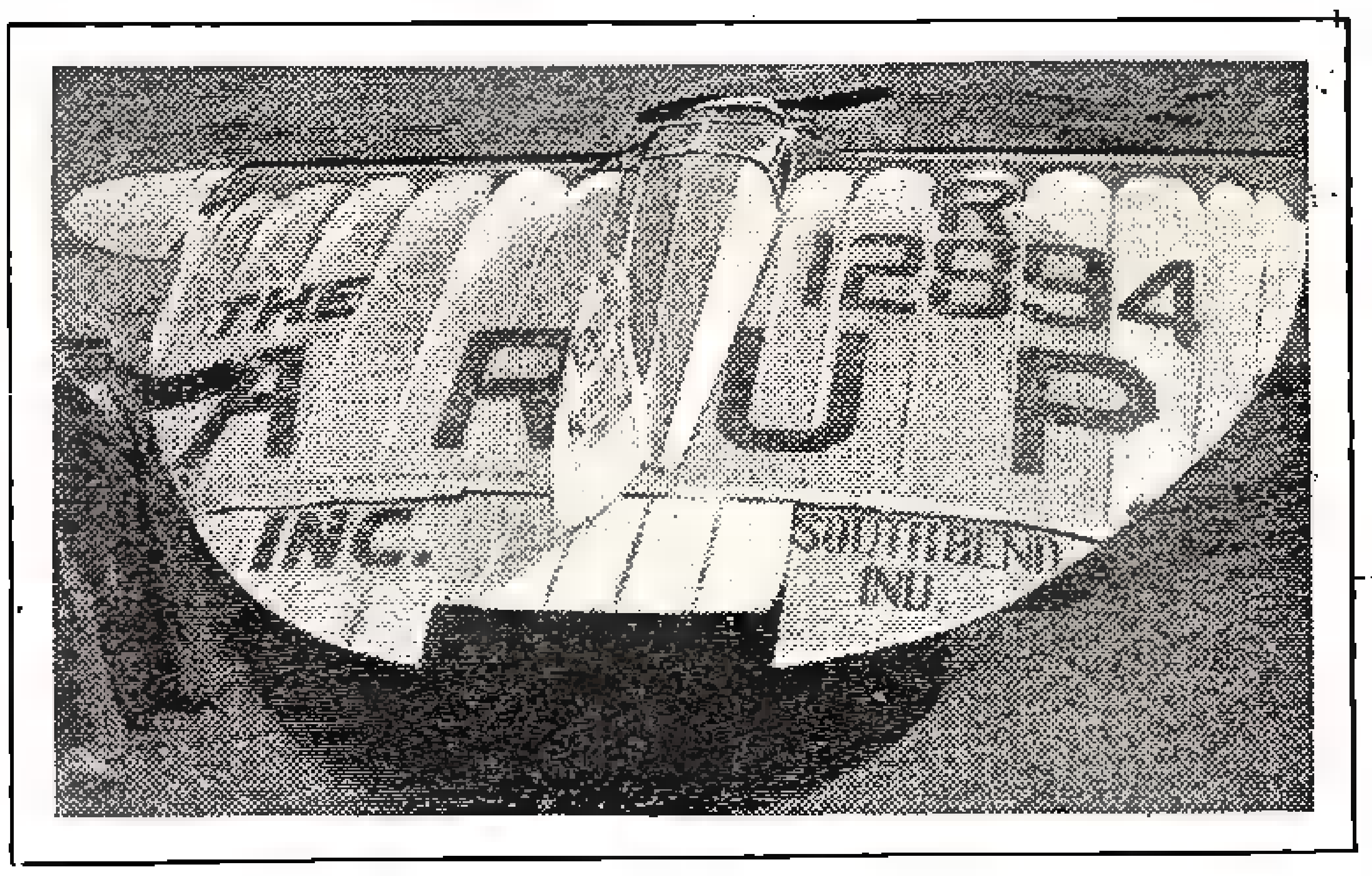
A CRAFTY sea gull has found a new way of getting his daily meals—and it beats panhandling or those handouts and pilfered crusts from boats along the waterfront.

This gull makes the rounds of office building windows around mealtime, until the welcome bag of lunch, set out by some friendly worker, is spotted. The bird has lost all fear of human beings.



Around mealtime this wise sea gull surveys office windows from the flagpole perch, in search of the daily lunch bag. Other more timid gulls usually arrive when the bag is empty.

Wing May Be New Air Flivver

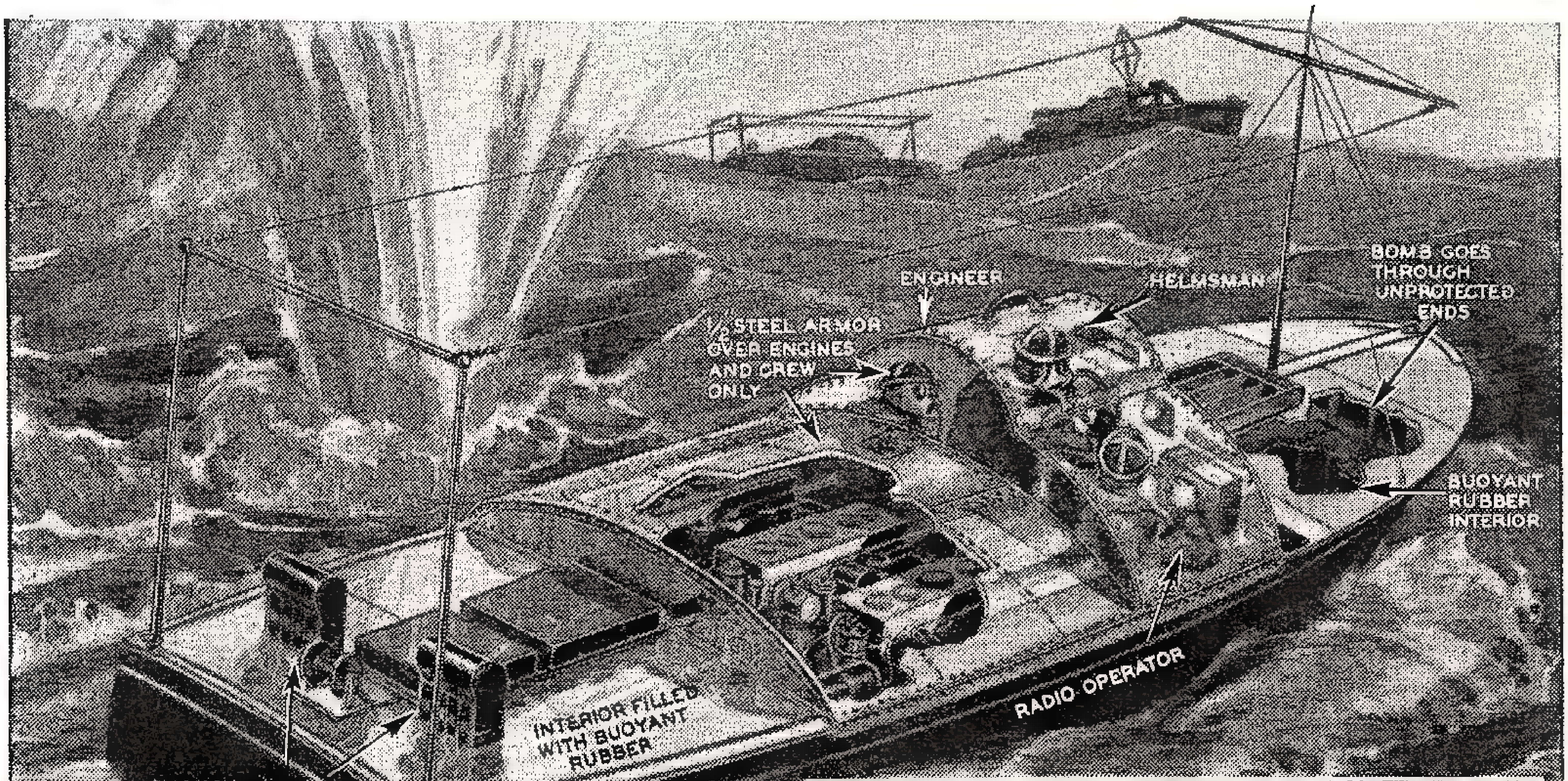


Here is the new flying wing "flivver plane" as it was shown to Dept. of Commerce aeronautic officials in Washington.

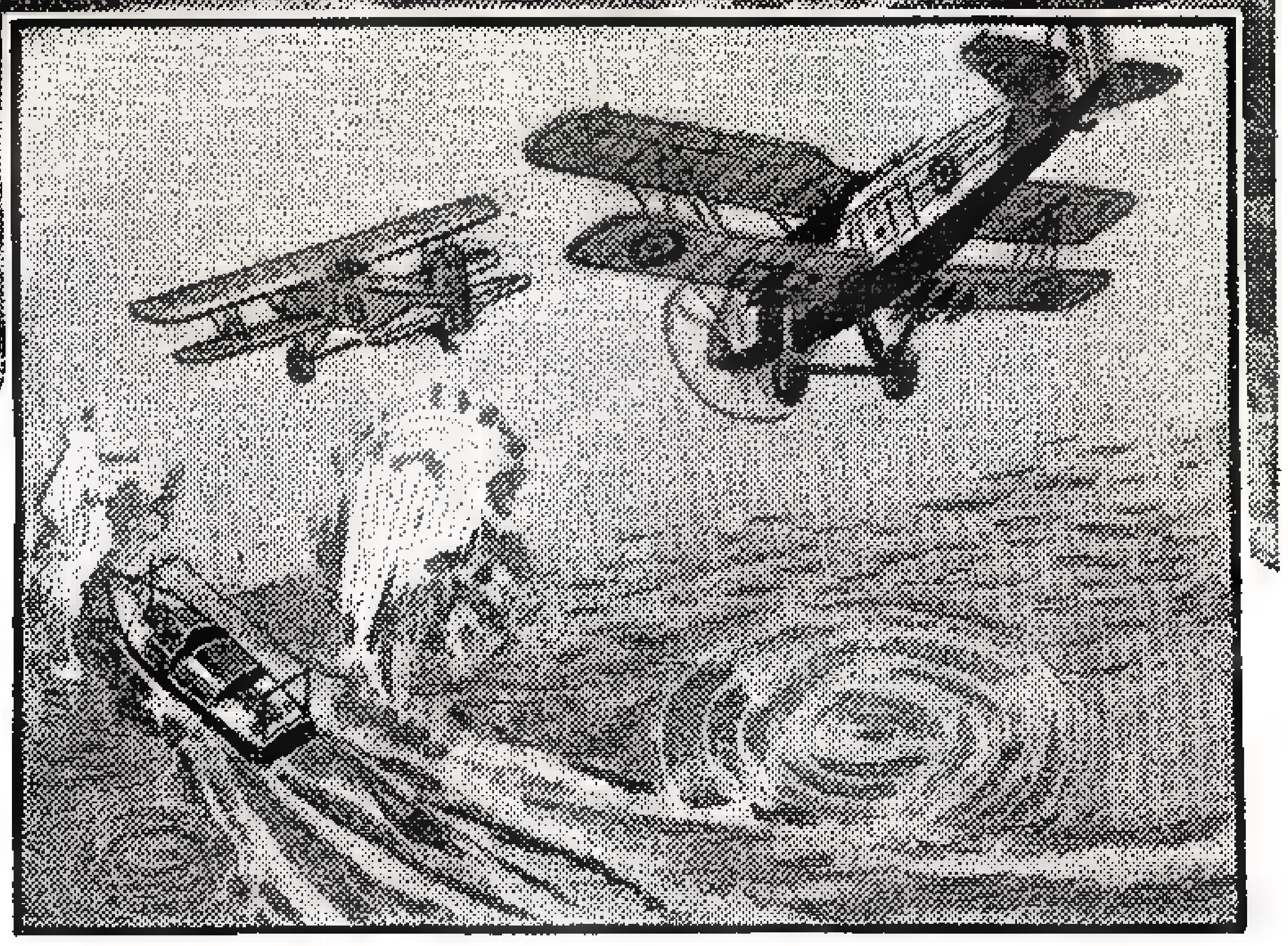
WITH the department of commerce considering authorization for building of "flivver planes" to sell for approximately $700, much interest has been aroused in a new flying wing model.

The new flying wing combines many well known safety factors with ease of handling and economy of operation. United States government officials are seriously considering licensing manufacture of the planes on a big production basis.

Human Targets in Boats Dodge Deadly Aerial Bombs


ENGINEER
HELMSMAN
BOMB GOES THROUGH UNPROTECTED ENDS
½ STEEL ARMOR OVER ENGINES AND CREW ONLY
BUOYANT RUBBER INTERIOR
INTERIOR FILLED WITH BUOYANT RUBBER
RADIO OPERATOR
SMOKE SCREEN OUTLETS
Saunders

This armored speed boat, piloted by a volunteer crew of three, cruises about on the ocean as Royal Air Force bombing planes swoop overhead, dropping showers of deadly aerial bombs. Hits and misses are radioed to planes above.

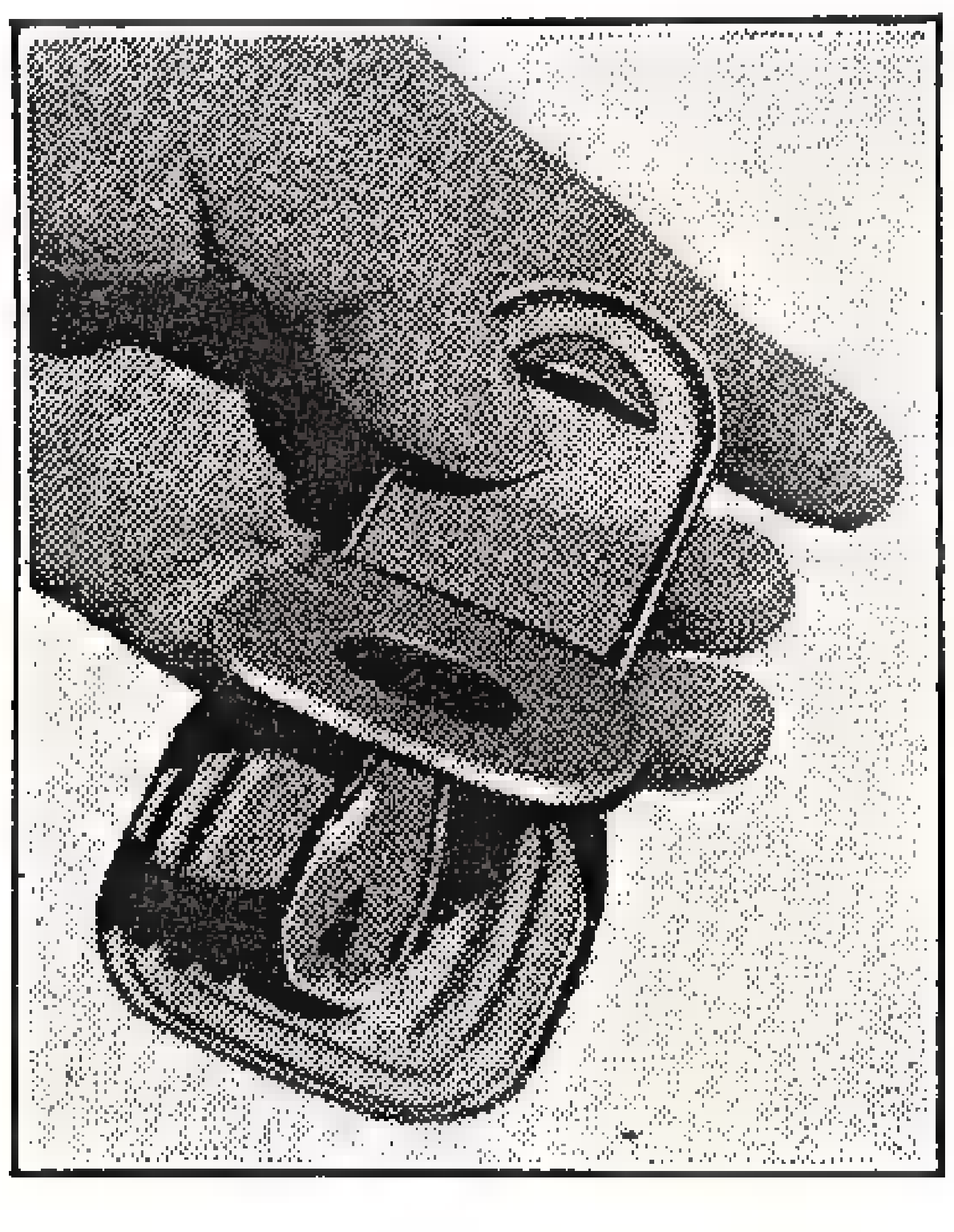


Bombing planes dive to 1,000 ft. to drop aerial bombs on small moving target boat. Many hits are registered.

ENGLISH bombing planes now practice aerial bombing on human targets. Deadly "eggs" are dropped from a great height on tiny speed boats maneuvered about by volunteer crews. Aircraftsman Shaw—famous as Lawrence of Arabia—pilots one of the boats in this dangerous game of "hare and hounds."

The boats have watertight compartments packed with expanded rubber ten times lighter than cork, to make them unsinkable.

New Mouse Trap Is All Metal



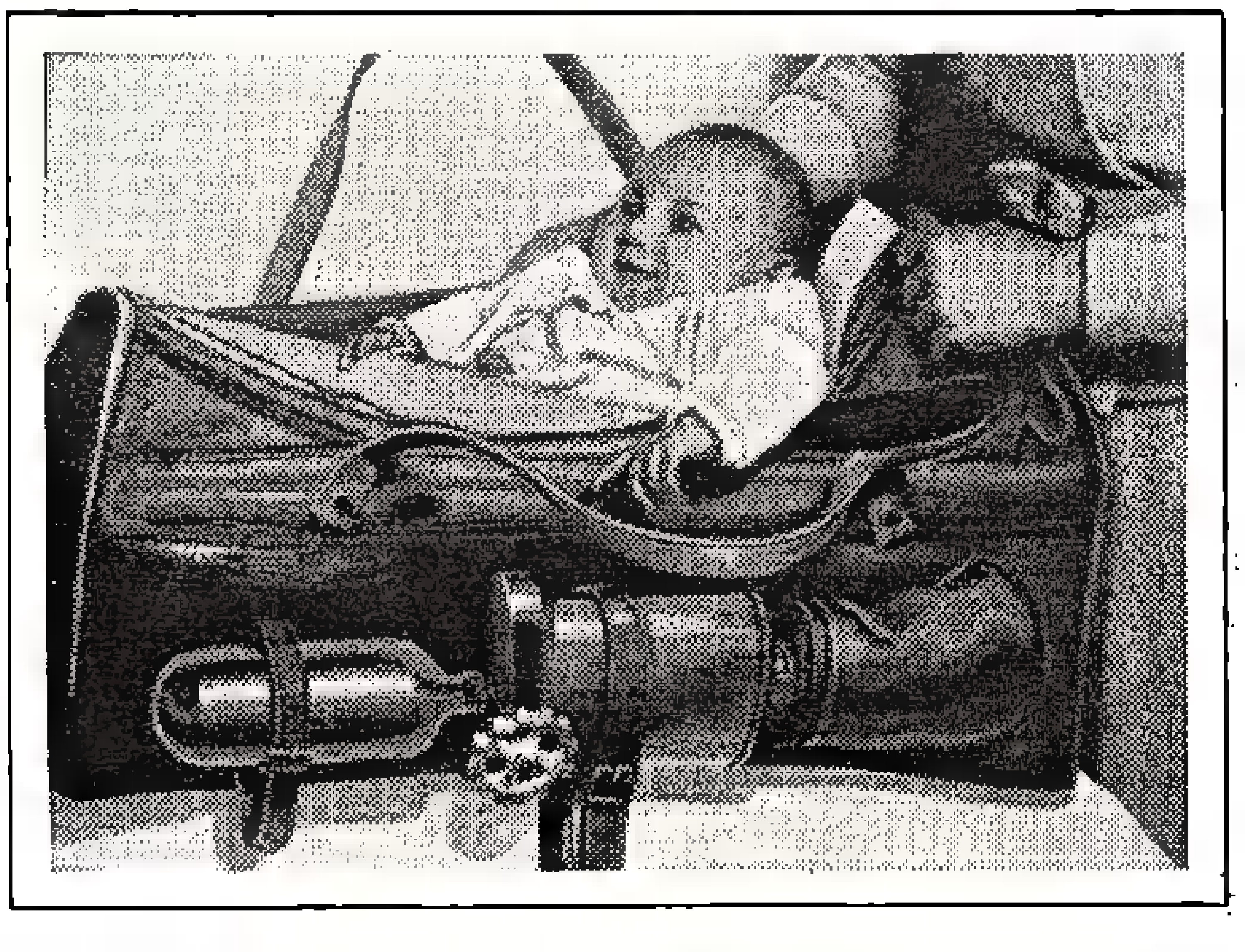
Trap is baited and sprung through hole in upper jaw.

AN ALL metal mouse trap which kills instantly yet offers safety to the operator.

A special latch operated by thumbnail pressure, opens or closes the jaws. Metal construction provides for effective deodorizing in boiling water.

Zipper Gas Mask Made for Babies

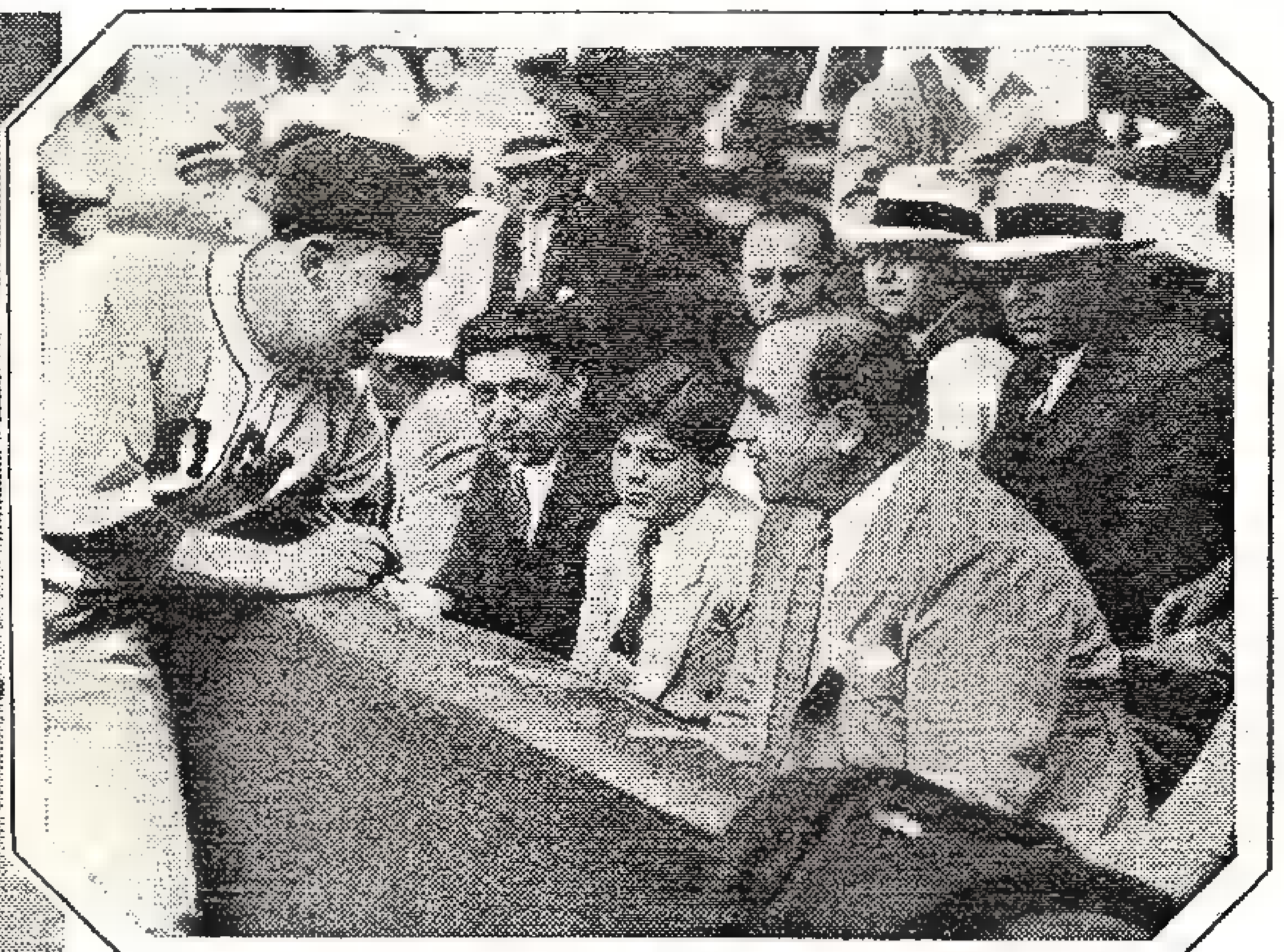
A SPECIAL handbag for carrying babies furnishes protection in case of a war-time gas attack. An oxygen tank begins to function as soon as the zipper cover is closed, supplying air to the baby.



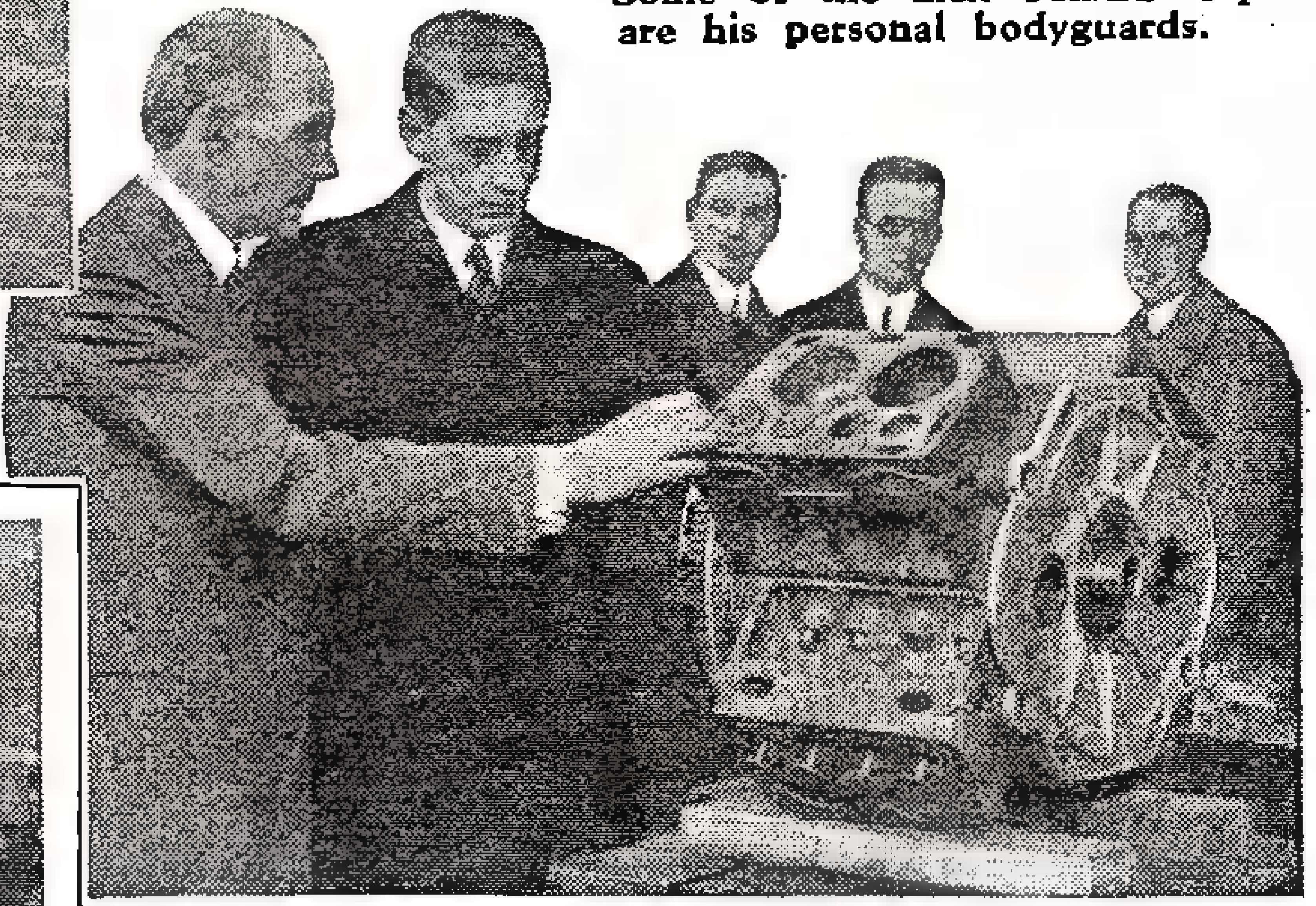
This zipper carrying bag to protect baby during war-time gas attacks closes tightly, and has oxygen tank to supply air.

Bodyguards Face DEATH

General and Mrs. Cornelius Vanderbilt go strolling down Fifth avenue on a joyous Sunday morning. Not far behind you will note a husky bodyguard.



Here's the boy who started the bodyguard industry on its way to prosperity. "Scarface Al" Capone, formerly of Chicago, but now of Atlanta, enjoying a ball game. Beside him is his son, Al, Jr. The ball player is Gabby Hartnett. Some of the men behind Capone are his personal bodyguards.



Henry Ford shows Prince Nicholas, of Rumania, what makes it run. But in the background are the ever present bodyguards. The two in dark clothes watch the Prince, while the one on the right shadows Ford wherever he goes.

John D. Rockefeller, Jr., (carrying valise), travels a good deal, but never without a physically competent and alert bodyguard. The bodyguard, as shown in this picture, constantly keeps an eye trained on all those nearby.

IN THE ordinary run of things, a man does not go about looking for trouble. But this is not the case with a new type of professional men. They are called bodyguards. Trouble is their business—and death not infrequently is their reward.

A bodyguard—and there are thousands of them employed throughout the country today, since the growth of kidnaping and the advent of gang terrorism—must be ever on the alert to forestall tragedy. He must grapple with cranks, fend off kidnapers, shoot it out with a would-be assassin—even offer his own body as a target in order to protect the man or woman under his care.

Perhaps you recall the attempt to assassinate President Roosevelt in Miami, Florida. You will also remember that within a few seconds after the shots were fired, the

to End KIDNAP MENACE

by HARRY BERNSTEIN

Unique and dangerous profession springs into being as the rich seek protection against gangsters. Personal guards must be capable of putting up battle or sipping tea in fashionable drawing rooms of social elite.

Great Britain takes necessary measures to protect its prime minister, J. Ramsay MacDonald. Leaving St. James Palace, Premier MacDonald is trailed by a corps of bodyguards.

President Roosevelt is under constant watch by an entire squad of secret service operatives. But he also has his personal bodyguard, shown at right.

President found himself surrounded by a wall of human protection. Any more bullets would have had to drill through some faithful guard before reaching the chief executive.

A few years ago, the President of the United States and certain very high governmental officials were the only ones who enjoyed the company of bodyguards. But such is the pathway of modern civilization that today almost every man of wealth or political importance feels unsafe unless his very tracks are dogged by a faithful and physically powerful servant.

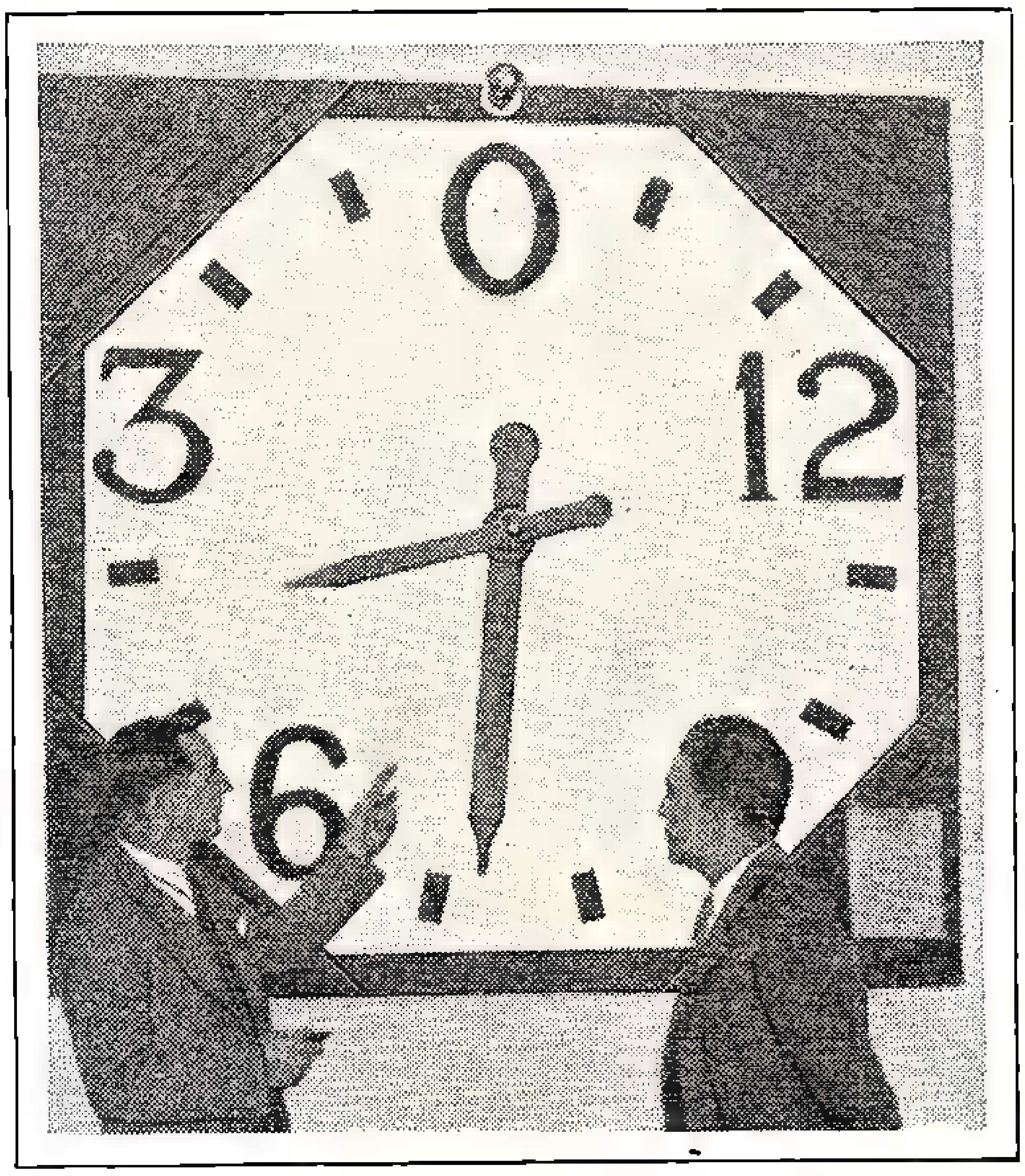
The personal bodyguard is a direct product of the era of gangland. Big shots of the underworld, like Al Capone, started the fad as a means of self protection against rivals.

Then, when the gangsters turned to the lucrative pastime of kidnaping wealthy men and women and holding them for ransom, the employment of bodyguards

(Continued on page 120)

Children of wealthy persons are under heavy guard these days, due to the many kidnaping attempts that have been made in recent years. The baby son of Samuel Insull, Jr., is never permitted to leave the house unless his nurse is accompanied by a bodyguard, as shown in this picture.

Electric Timing Clock Controlled From Athletic Field



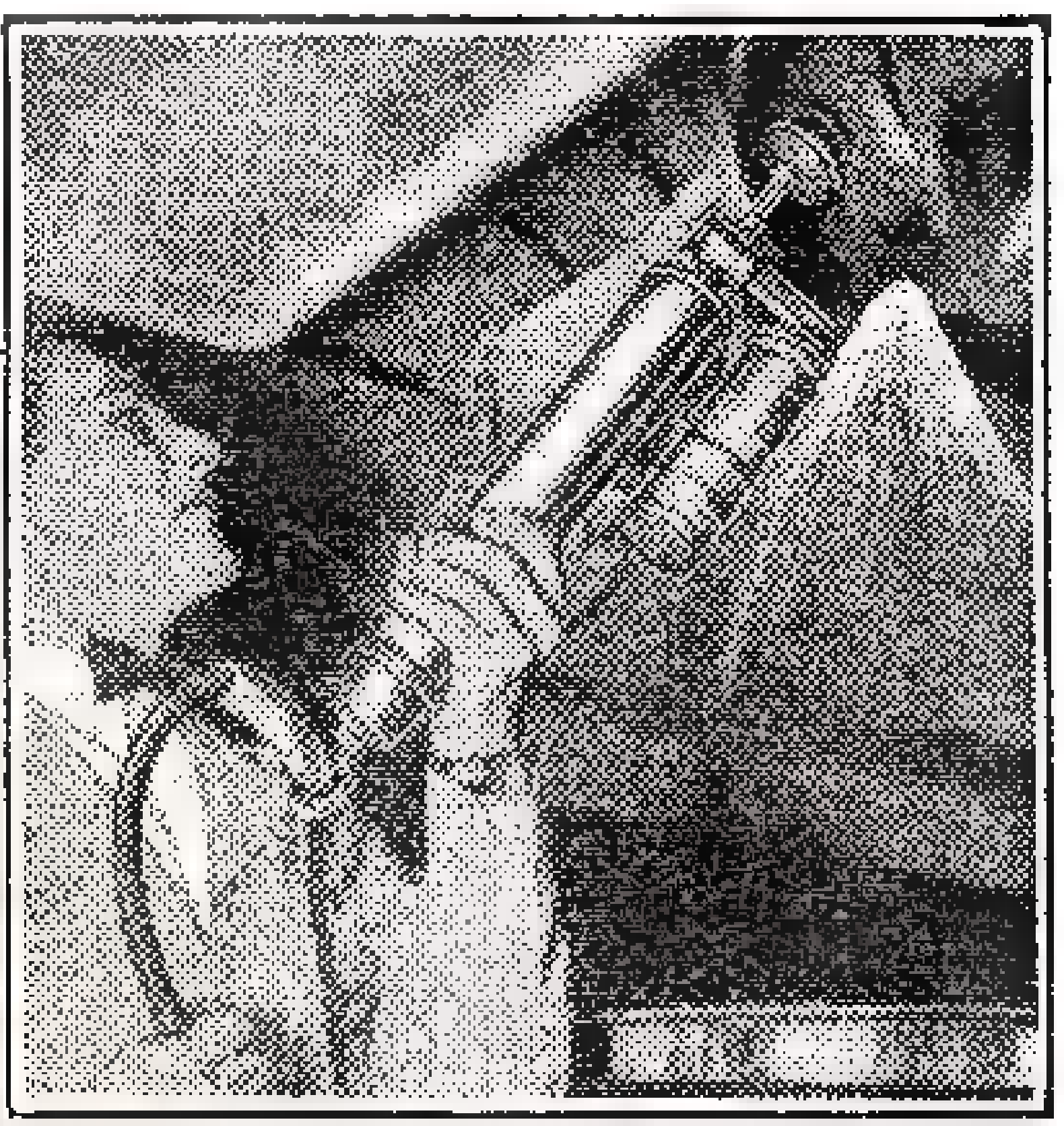
This clock, invented for use on football fields, has won approval of coaches throughout the country. It is handled by timekeeper and gives accurate check on time left to play.

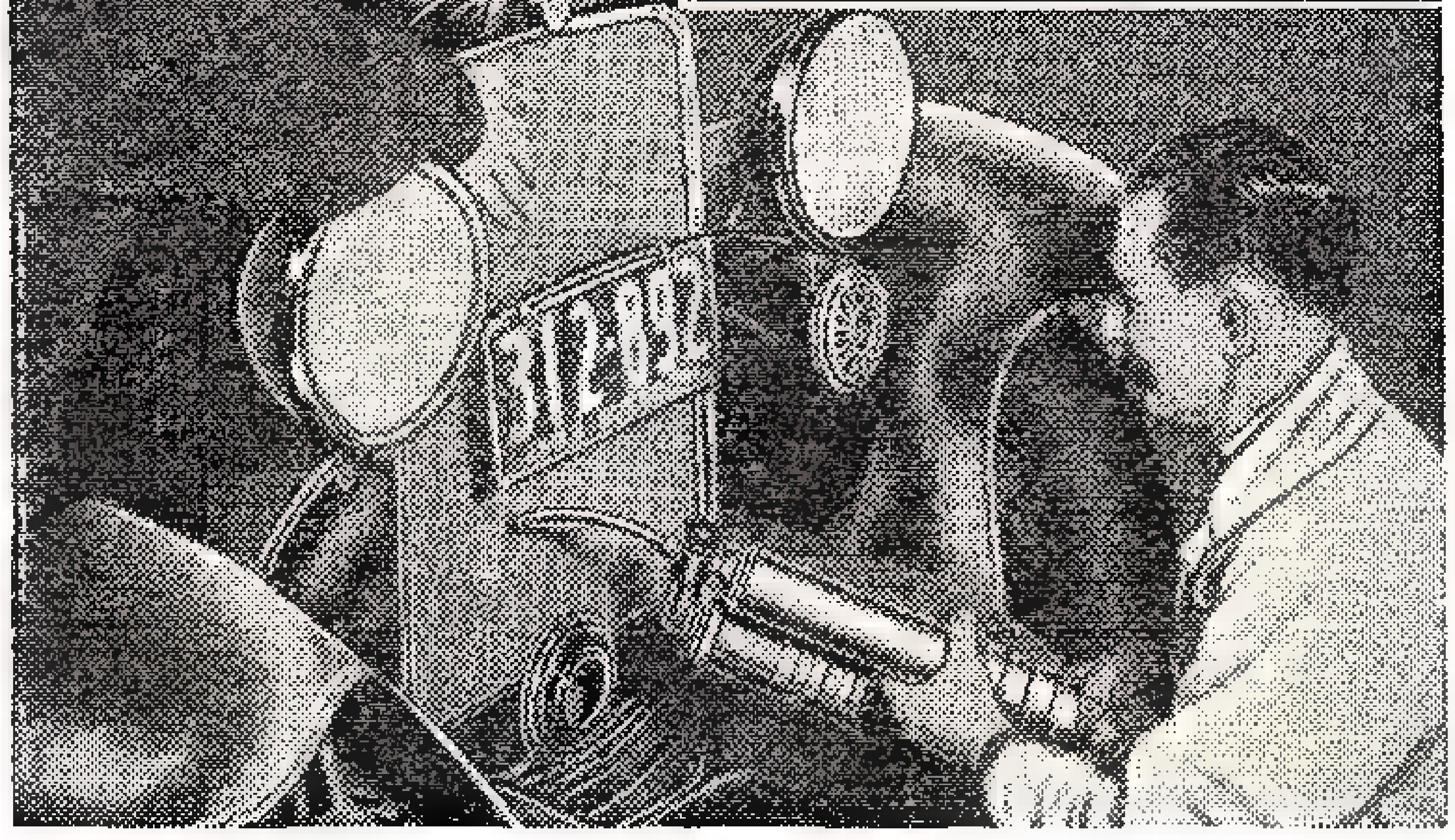
Hot Air Used to Expel Grease

HOT air guns now on the market will drive out frozen grease and sludge in transmissions or differentials of automobiles or trucks.

The gun, attached to a compressed air line, heats the air as it passes through and ejects it at terrific speed. The apparatus also quickly thaws out a frozen radiator.

Old grease and sludge come out easily, with the help of hot air, injected through this gun.





Frozen radiators are easily thawed out in ten or fifteen minutes. Ordinary compressed air passes through a series of heating chambers before gun expels it at terrific speed.

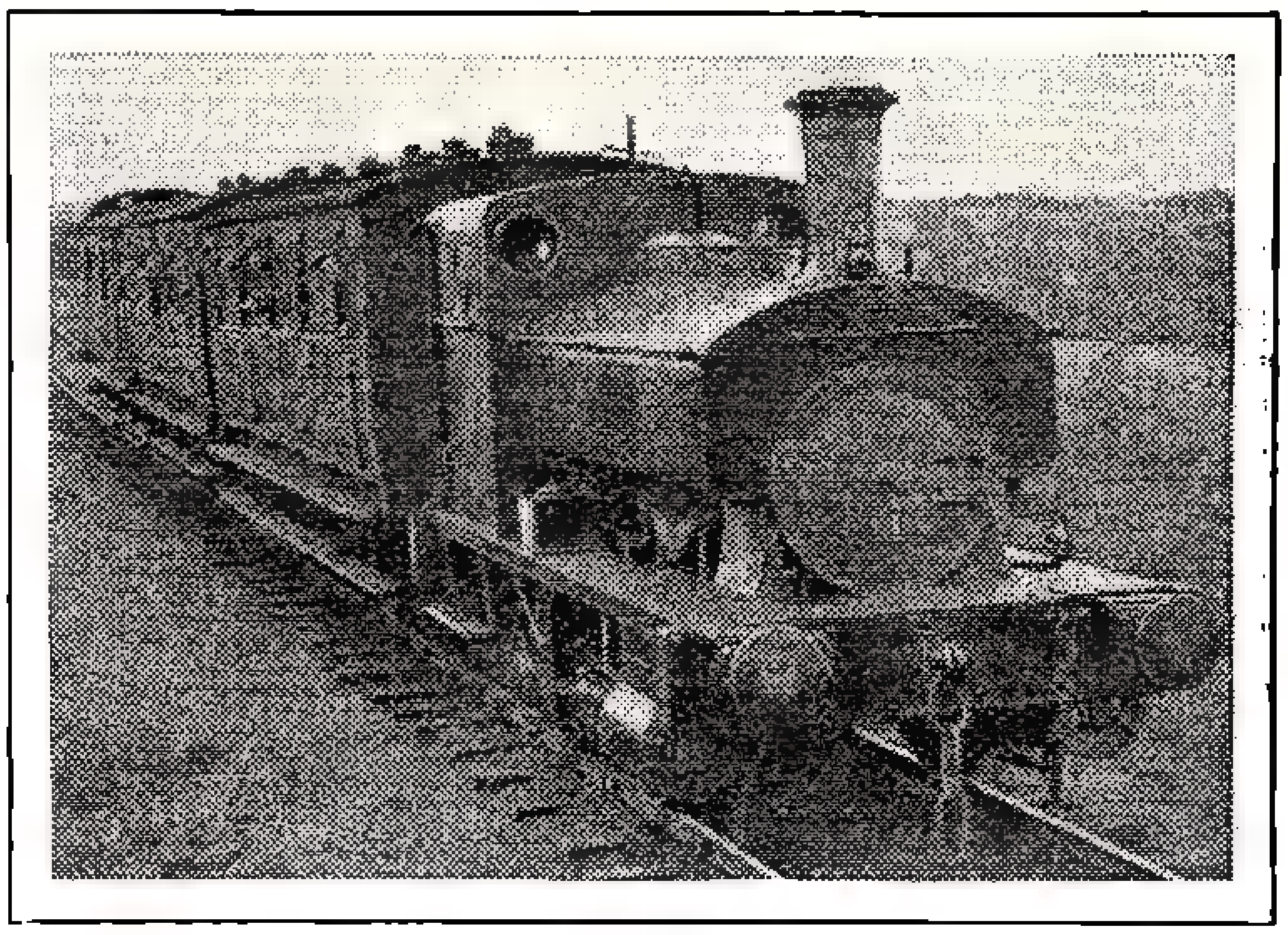
FOR years the matter of timing a football game has always been a source of controversy. Either one side or the other would claim that too much time was allotted the opposing team or claim that the periods of play were "stretched."

That there was usually a discrepancy in official timekeeping was demonstrated by the fact that the time, as kept on the field, was seldom in accord with the time shown on the official field score board.

Now coaches and other gridiron officials are hopeful that such trouble is at an end, with perfection of a football clock recently exhibited to members of the American Football Coaches' Association.

The clock is several feet in diameter and is designed to be placed at one end of the field. It is operated by electricity, with the control button in the hands of the official timekeeper, right on the field.

You Can Ride Free on This R. R.



This miniature railroad runs for the fun of it, so to speak. People who live in its district are permitted to ride free.

PERHAPS the only railroad that permits its passengers to ride without paying fare is located between the towns of Grimsargh and Whittingham in England.

The railroad was constructed fifty years ago for use of the Whittingham Mental Hospital staff and is still used for that purpose. However, inhabitants of all nearby villages are permitted to use its facilities free of charge. As a consequence, the little railroad does a thriving business.

Clock Tells Time Over Telephone

A RECENTLY invented "speaking clock" is a huge success in Paris, telling time to over 11,000 people a day. The clock can speak to thirty people at once.

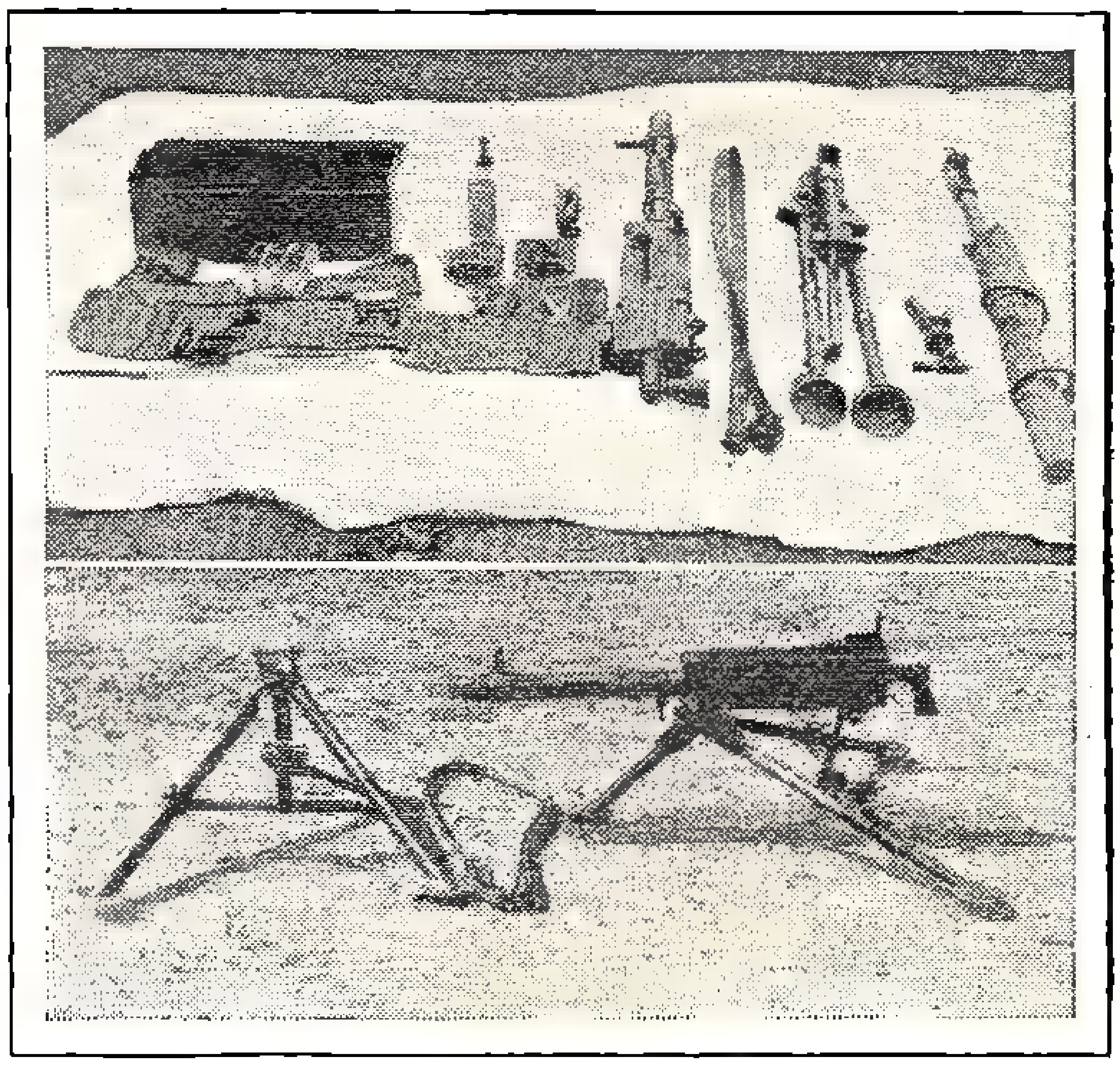
The telephone subscriber merely dials "Odeon 84-00" to hear the robot voice call out the exact hour, minute, and second. A photo-electric cell and reels of sound film make up the robot's voice.

U. S. Cavalry Adopts Air-Cooled Aviation Machine Gun

UNITED STATES cavalry officers are now testing out a modification of the latest tank machine gun, a weapon lighter than that used by the infantry, but having a greater rate of fire than the automatic rifle. The tank gun was developed from the light-weight machine guns used in aviation.

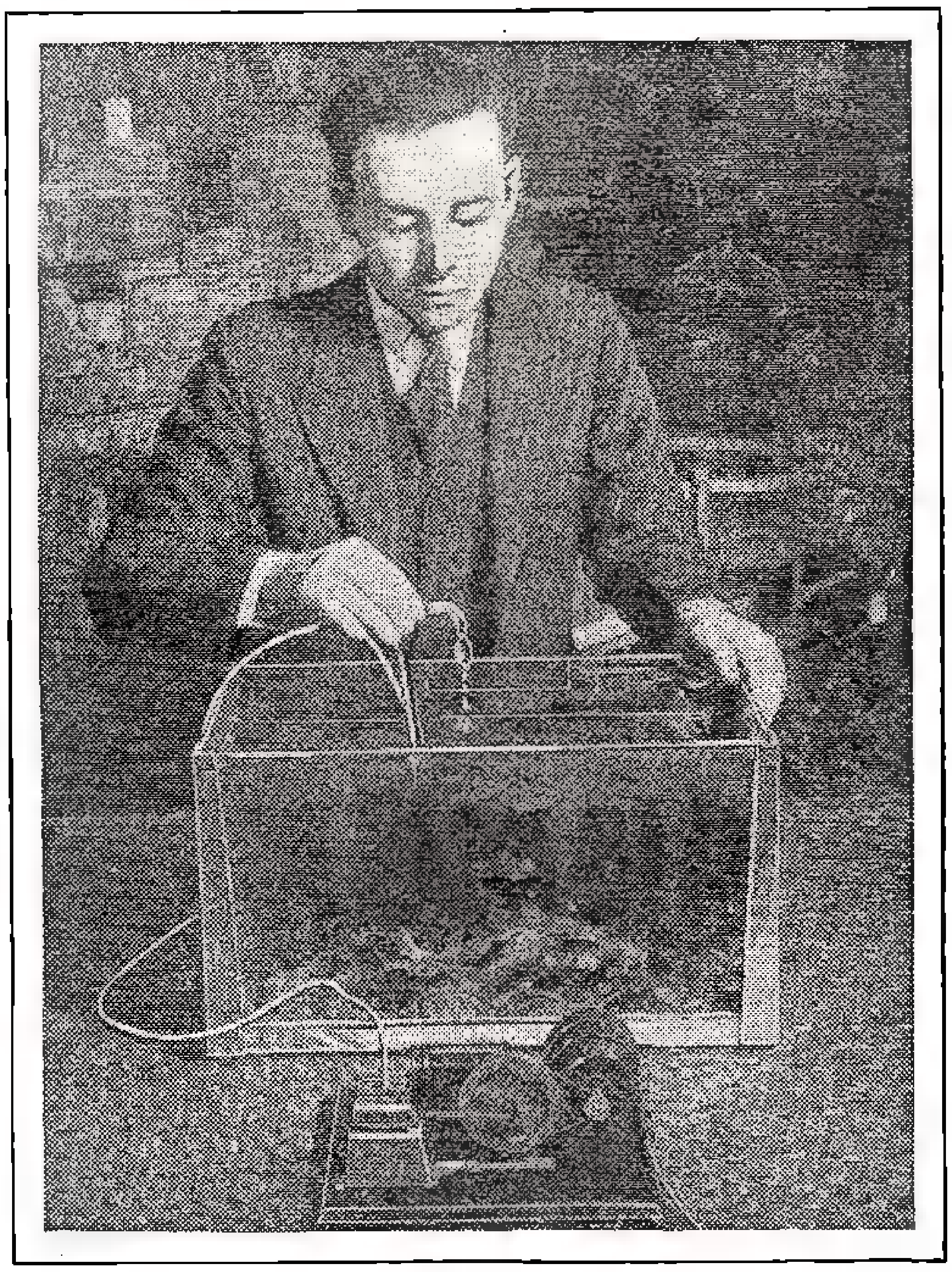
A cavalry machine gun must be light enough to be carried on one horse, permitting the animal to travel fast without too much fatigue. It must be designed to be unpacked and made ready for use almost instantly, since cavalry units move ahead and are more likely to be surprised.

The water-cooling jacket has been eliminated, since cavalry normally does not fire the gun over extended periods of time, and an air-cooling arrangement is used.



At top: New cavalry machine gun assembly, complete with repair kit and spare parts. Below: Light weight tripod mounting, and a machine gun mounted ready for action.

Tiny Air Compressor for Aquarium



Air compressor unit driven by tiny 110-volt electric motor forces fresh air and oxygen through glass tube projecting down into the aquarium. Very little current is used.

FRESH air for the finny inhabitants of your aquarium can now be obtained from any electric light socket, with a recently marketed air compressor driven by a tiny electric motor.

The compressor unit may be installed out of sight, and rubber tubing used to connect it to the glass aerator tube dipping into the aquarium. About two hours of operation per day is said to be sufficient to refresh the water of an average size aquarium.

Rangers Find Story Without Words

MUTE evidence of a forest tragedy, a story without words, was found by forest service rangers near Portland, Oregon.

While checking up on the forest service telephone wires, rangers found a pair of deer horns entangled hundreds of times in the wire. The horns are deeply scarred, with broken tips giving indications of the terrific struggles of the terrified deer.

This wire is extremely difficult to bend with the hands, but here it was hopelessly ensnarled about the horns and the limb of a tree. Telephone service was not interrupted, however, for the wire never broke.

A forest tragedy—deer horns found by rangers near Portland, Oregon. Deeply scarred horns and twisted tree limb are entangled hundreds of times in a forest service telephone wire. Service was not interrupted, for the wire, difficult to bend with the hands, never broke.

Timely TIPS for TUNING

Tune up the motor, tighten loose frame bolts, clean off the winter's mud, and the old bus is ready for spring driving.

Squeaks and rattles in the doors disappear when pieces of inner tube rubber are cemented over the old rubber door buffers. Upper right—Tightening body bolts in chassis.

by F. H. MONSON

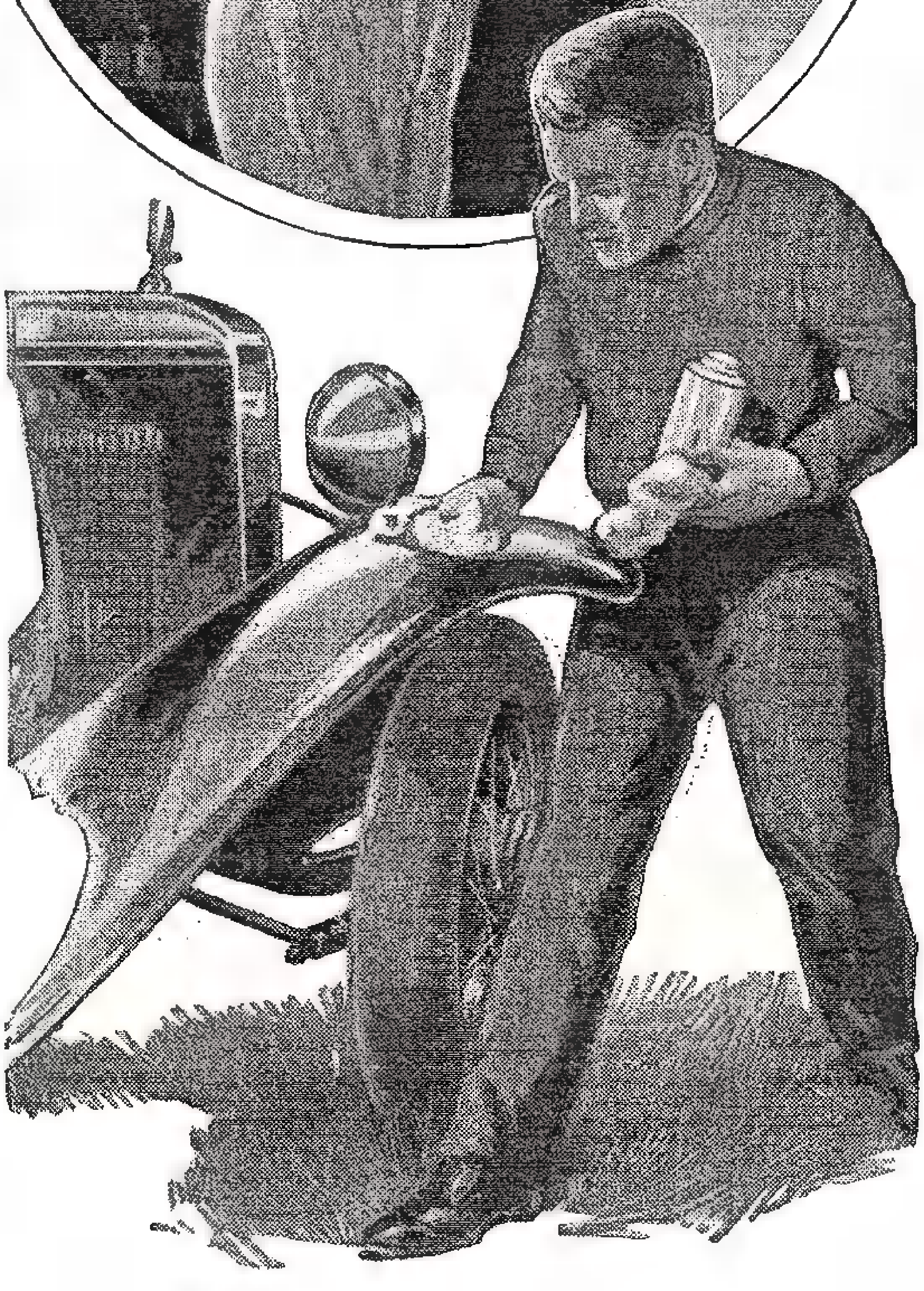
SPRING is the time to tune up the old bus and get it ready for a summer of pleasure. Winter is so hard on any automobile, that a spring overhauling is a necessity.

There are a number of things that you can do about your car to provide more comfort, safety and freedom from breakdown. Perhaps the first object of attention should be the motor: If the points in the distributor are pitted, remove them and dress their faces on an oil stone until clean. If they cannot be cleaned properly it is wise to replace them with new ones.

Distributor Point Clearance

After installation, space them to the proper clearance, as specified by the manufacturer of your car. This clearance is usually about 18/1000 of an inch, or about the thickness of the wire in an ordinary paper clip.

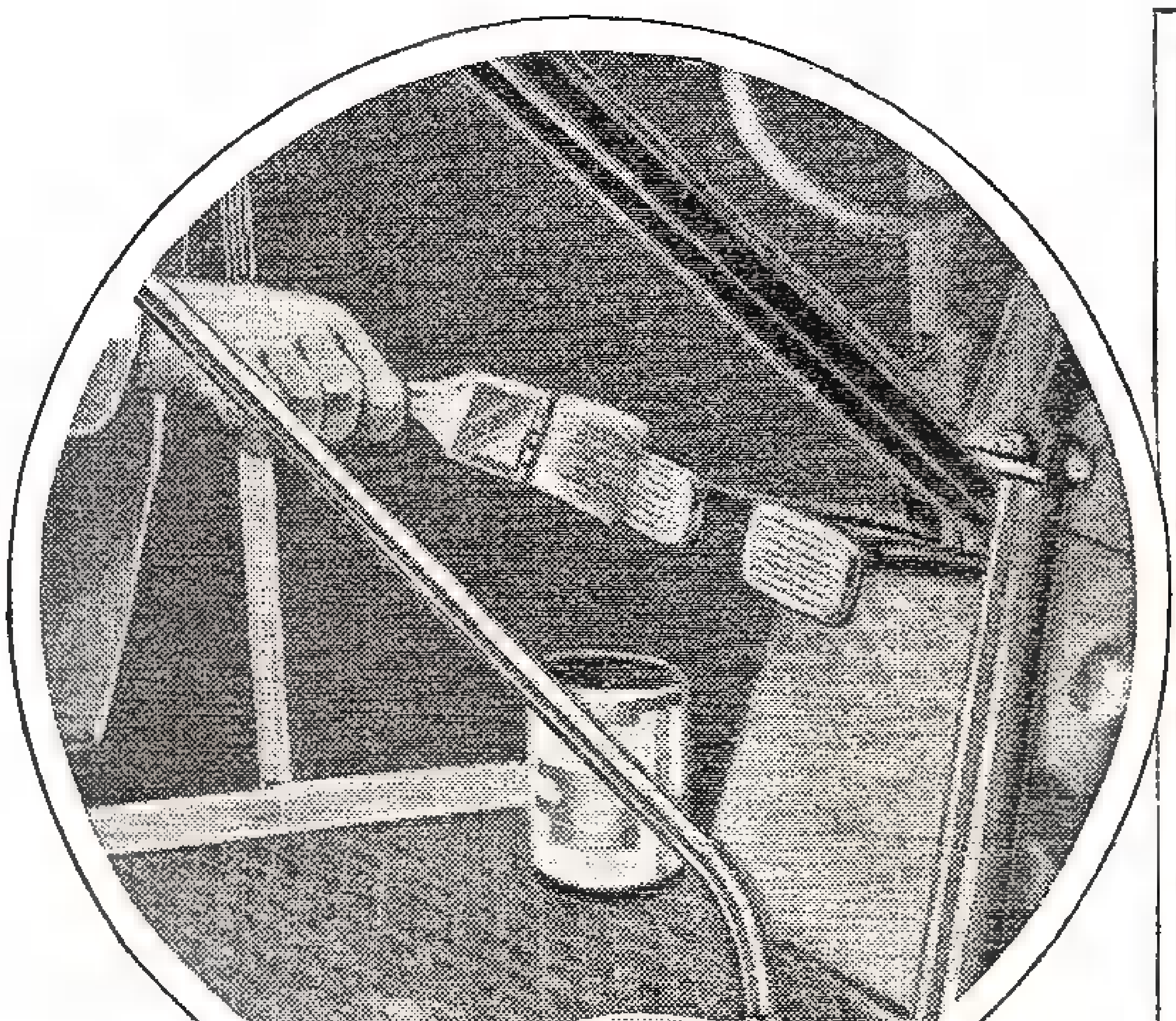
See that the distributor cap is clean and free of cracks. Inspect the spark-plug wires, and if they are cracked or oil-soaked, replace them; the best plug in the world will not fire properly unless the wires feeding it are in good order. Remove the spark plugs and clean them. Most cars require a spacing of 25/1000 inch of the spark plug points. It is important, for good idle and high speed, that the plugs are set carefully and uniform.



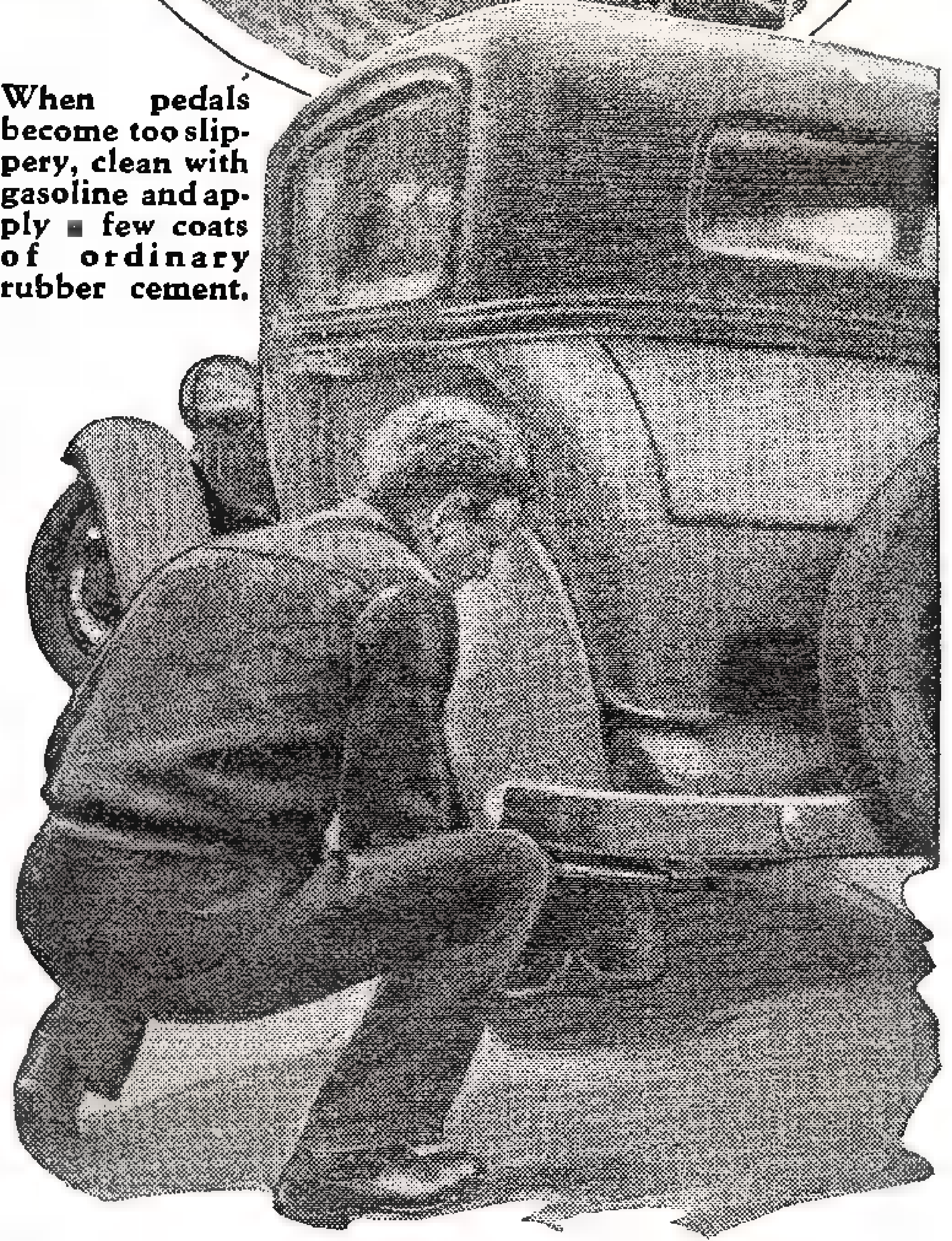
A coat of standard auto wax rubbed into the finish after mud has been washed off will greatly improve appearance.

If the generator commutator is dirty,

UP YOUR CAR This Spring



When pedals become too slippery, clean with gasoline and apply a few coats of ordinary rubber cement.



Spring shackle bolts determine to great extent riding qualities of car. They should be greased, and not too tight.

clean with sandpaper, using a light pressure, while the motor is running. Never use emery cloth for this operation. It is best to put the sandpaper on a stick to prevent clipping the fingers. Readjust the charging rate to about 10 to 12 amperes, which should be enough for warm weather driving. Most generators are adjustable in the third brush —the narrowest of the three—which is locked by a screw on the back plate of the generator. Moving this brush in the direction of the rotation of the armature increases the charging rate.

Clean running board, fasten down new mat with rubber cement, pile on sand to press mat firmly down at all points.

After you have drained the anti-freeze from your radiator, flush the system with clean water, tighten the water-pump packing nut just tight enough to prevent leakage, and refill. If it is necessary to flush the radiator with a cleaner it may be done with a sal-soda solution. Never use a flushing compound if your car has an aluminum cylinder head. In this case the radiator must be removed and cleaned separately from the block.

Check Electrical Connections

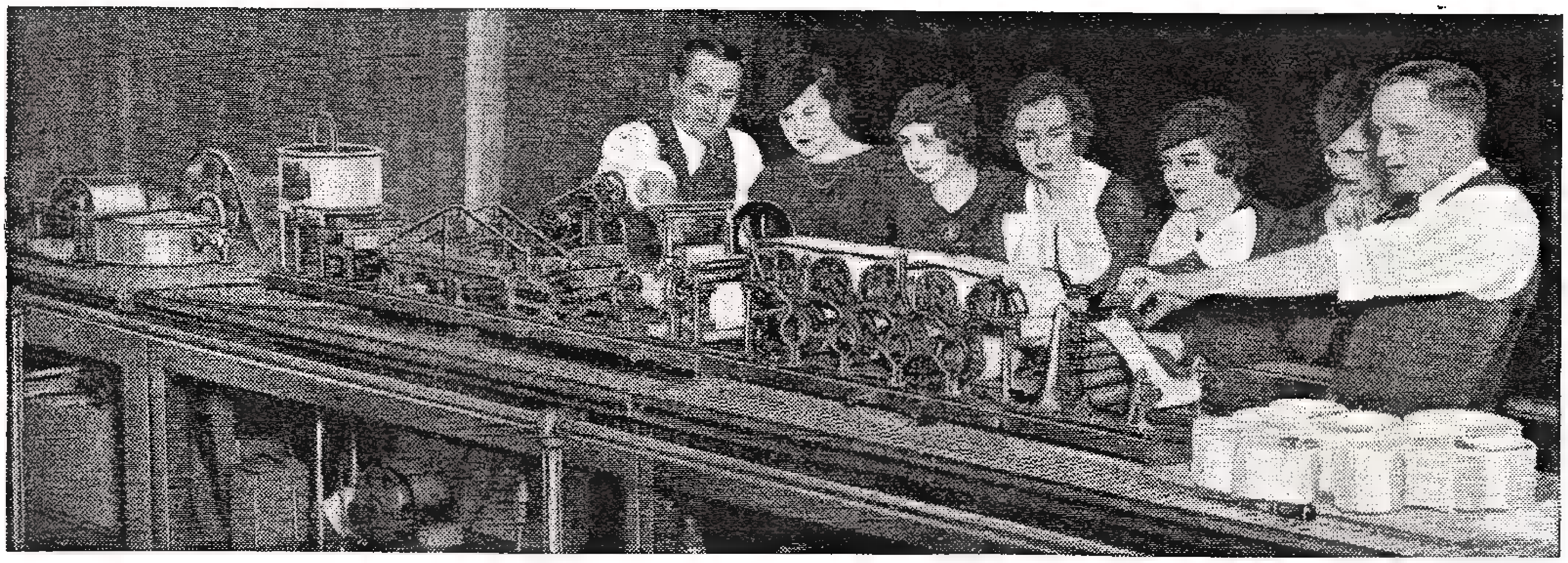
After you have done all the above work it is wise to tighten all electrical connections on the car—on the dash, instruments coil, lights, distributor, generator, starter and battery. Clean the top of the battery with a solution of household soda and water —then flush off with water. This removes all acid and prevents corrosion.

If you will now grease and lubricate your car carefully, from front to back, you are ready to tackle the job of squeak and rattle hunting. Tighten all body bolts. These bolts hold the body to the frame, and are located, four to six in number, on each side of the frame. The nuts are tightened from the bottom, against the frame.

Almost any car over a year old will develop a cracking or squeaking noise in the

(Continued on page 118)

Amazing Miniature Machine Successfully Makes Paper

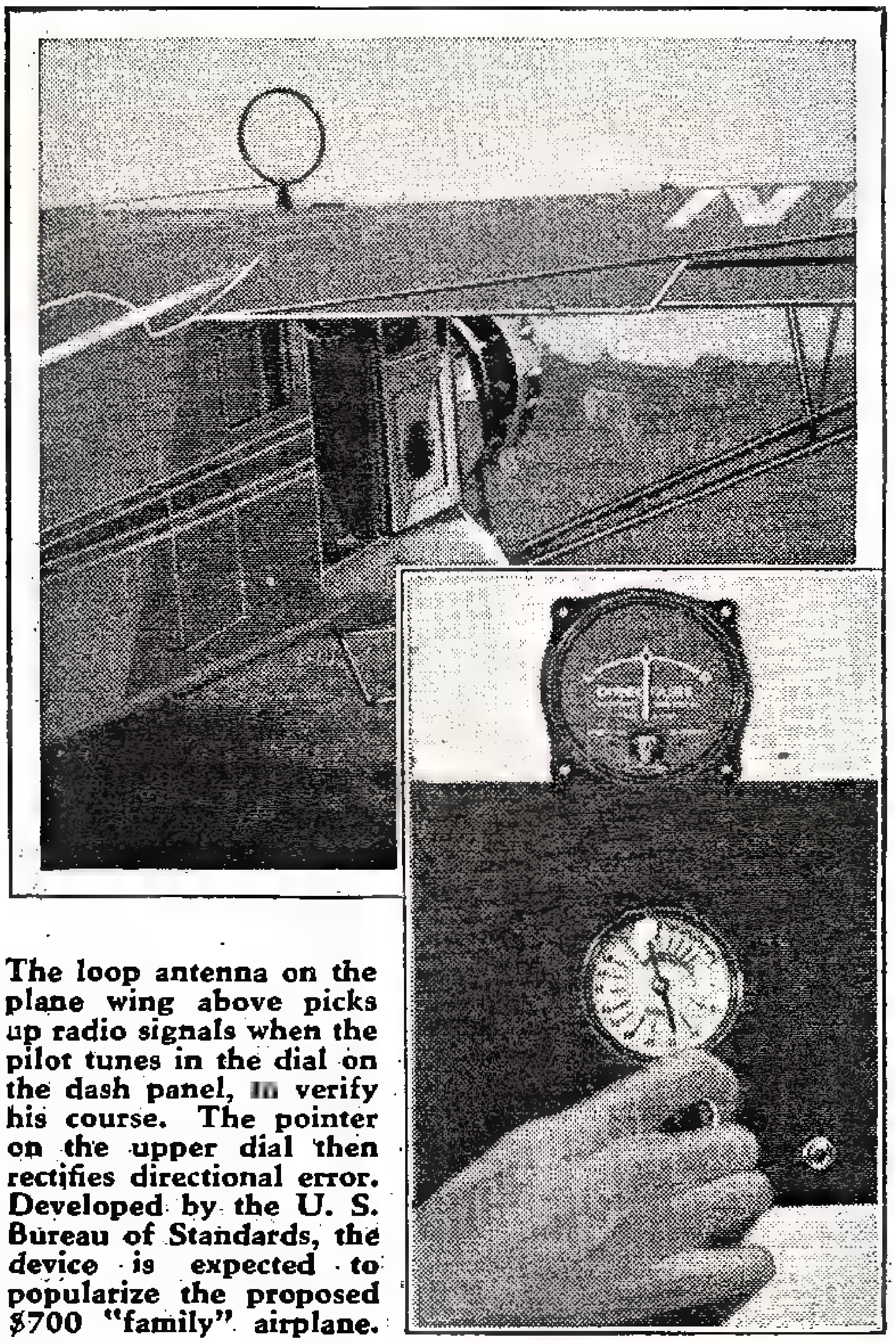


Replica of its giant counterpart in a Michigan paper mill, this miniature paper-making machine turns out the finished product before the eyes of onlookers. Every step is complete from the beating vat to the final drying process.

Direction Finder for Air Novices

AERIAL navigation is simplified with the use of a new direction finder which enables a novice to fly a straight course toward any radio station on which he is tuned.

A dial pointer on the dash panel points to zero when he is flying straight, veering to right or left with a change of direction. When lost in clouds and flying away from the station, needle action reverses, showing left when flying right and vice versa.



The loop antenna on the plane wing above picks up radio signals when the pilot tunes in the dial on the dash panel, to verify his course. The pointer on the upper dial then rectifies directional error. Developed by the U. S. Bureau of Standards, the device is expected to popularize the proposed $700 "family" airplane.

FROM crude pulp to the unwinding of the finished rolls, this miniature paper-making machine is complete in every amazing detail.

A beater first cuts the pulp to shreds. The mass is then impregnated with 99 percent water and is passed over various screens and between rollers to shape the paper and eliminate moisture.

Sixteen feet long and two feet high, the machine turns out a four-inch roll of paper three feet long every minute. In comparison MODERN MECHANIX AND INVENTIONS uses enough paper in a year to cover a sidewalk 5000 miles in length.

Flashlight Used as Field Phone

Both voice transmission and reception are supplied by this flashlight-field telephone. A folding telegraph key, used for the sending of code signals, insures privacy.

A COMBINATION flashlight, telephone and telegraph device may be hooked in on telephone or fence wires to provide field communication.

Operating on a two-cell flashlight battery, the device has receiver and transmitter in one. It has a folding telegraph key for code signals and a flashlight lamp for copying messages at night.

Big Profits in Back Yard FROG Raising

A back yard is large enough to start the thriving business of frog raising. How to build up a big income with a very small investment is told in the following article. The white meat, with a taste similar to a tender, juicy squab, is greatly in demand.

by S. L. SCHUTT

WHEN Charlie, of the De Luxe Cafe, told me that he would have to discontinue serving frog leg dinners because his wholesaler couldn't supply the frogs, I became vitally interested in an industry that has proven to be more profitable, entertaining, and healthful than any other I have ever known.

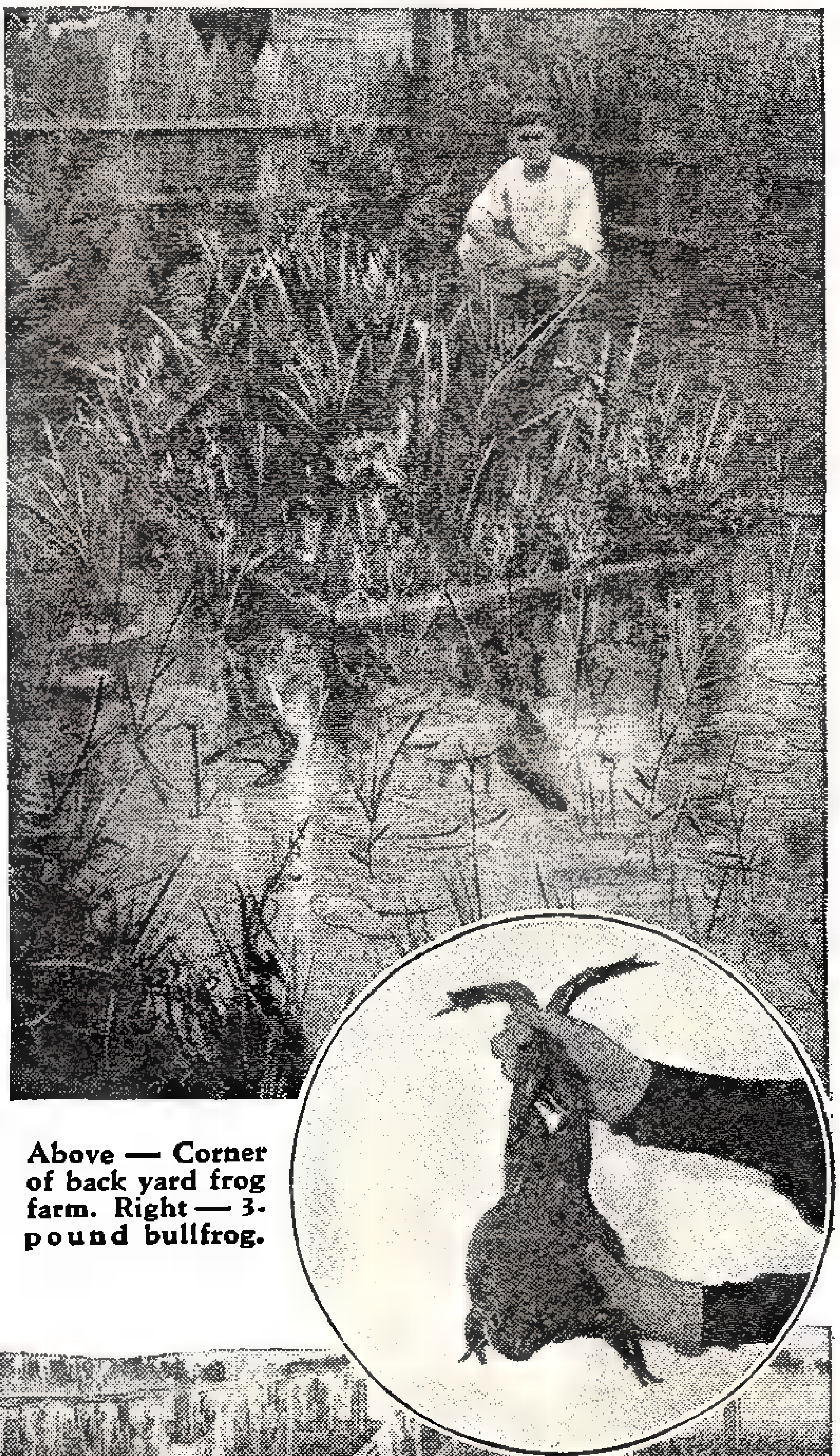
No frog farmer need search for a market, his crop is virtually all sold before it is raised. I could sell one hundred times my present production in a single week, and am expanding my ponds so, eventually, I expect to have 1000 acres utilized solely for giant bullfrog culture. I sell tadpoles at five to ten cents each by the hundred. They are used to stock farms and for aquarium purposes.

Frog Meat Is Delicious

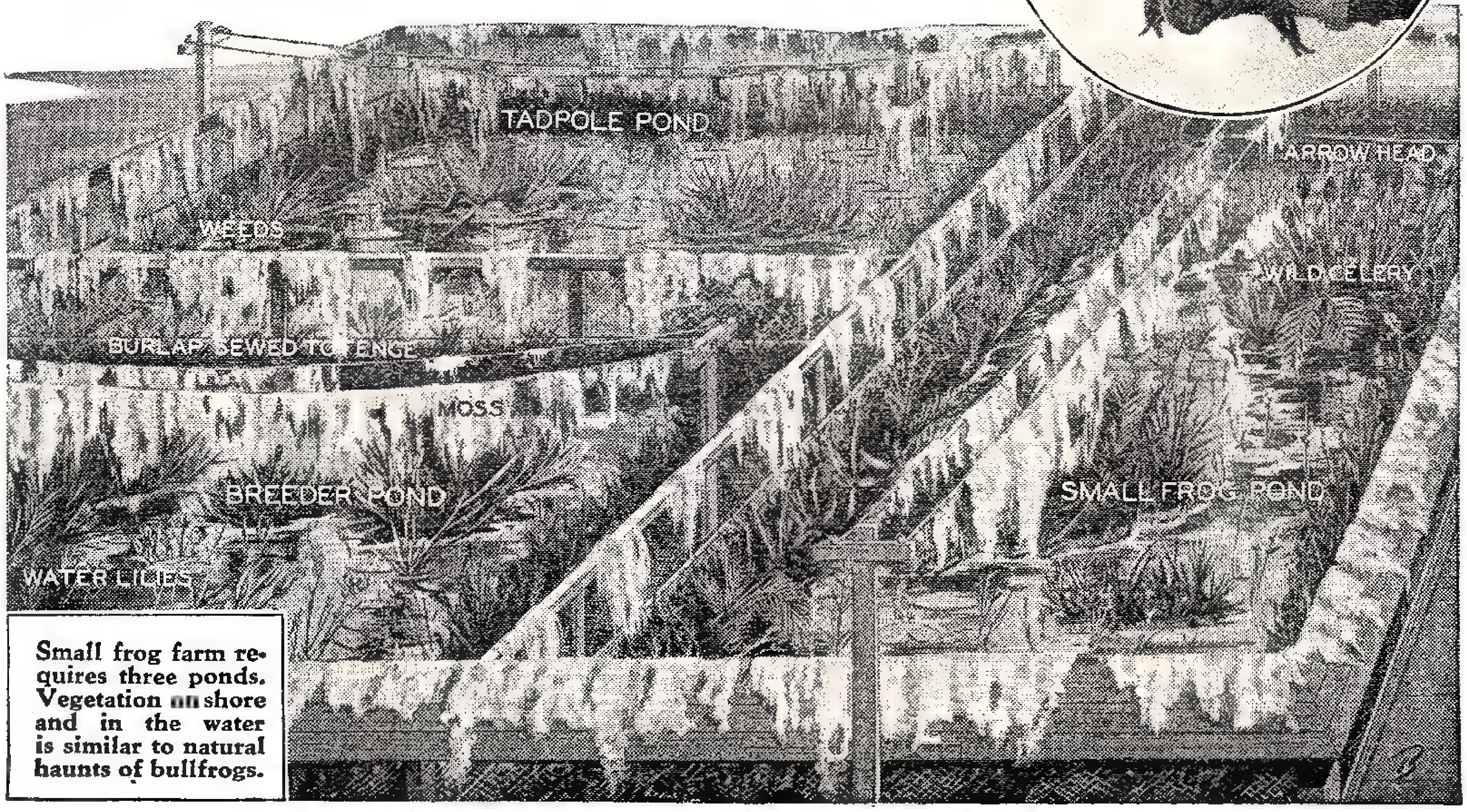
Bullfrogs, that cost me less than one cent per year to feed, wholesale at $3.00 per dozen in large quantities. Smaller frogs, of which only the legs are used, sell for as high as seventy cents per pound. Each frog gives a pound of delicious white meat that has a taste similar to a tender, juicy squab. The whole frog is used, the front quarter being just as delicious as the legs.

Just one pair of breeders lay over 10,000

(Continued on page 128)



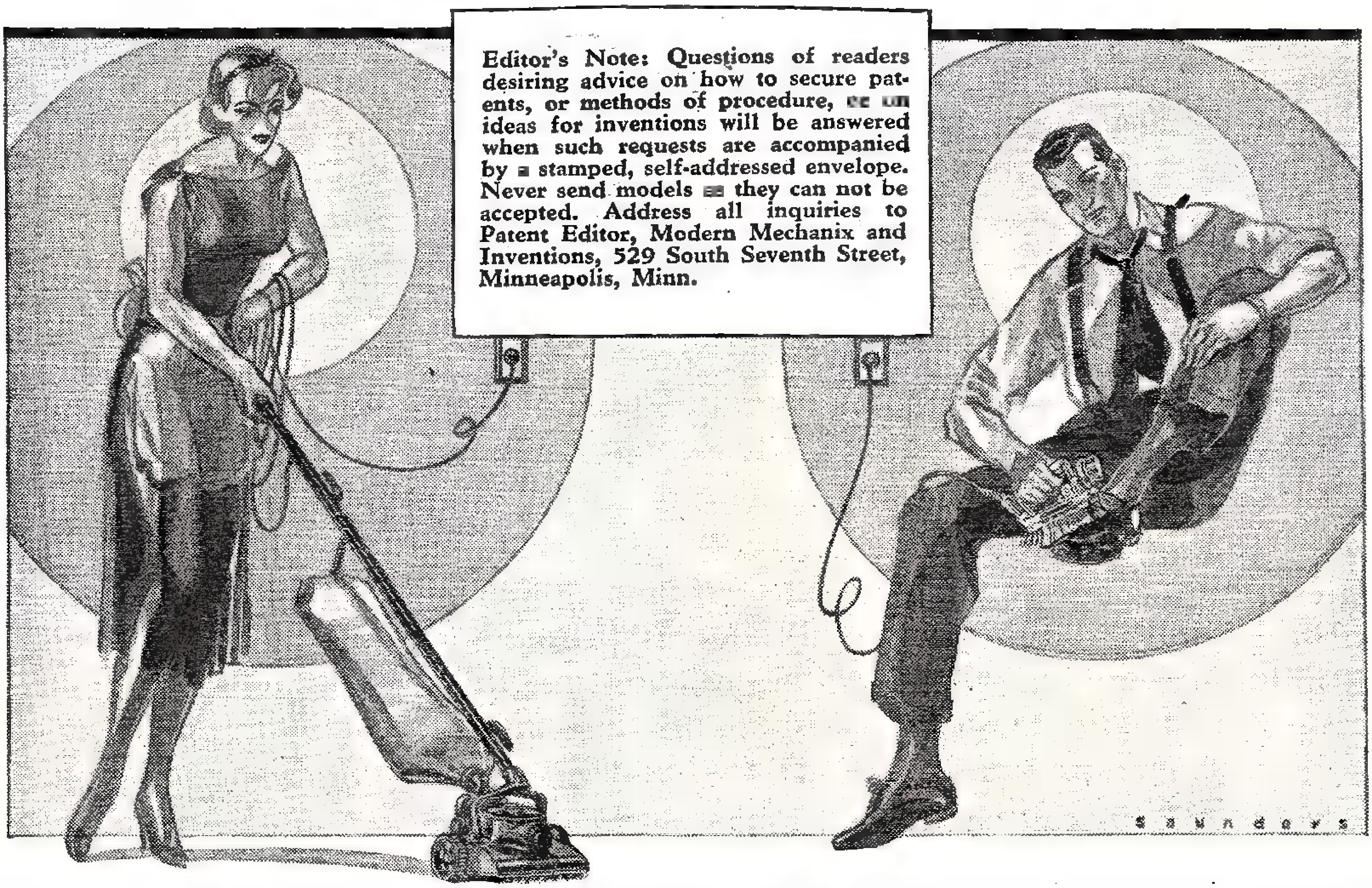
Above — Corner of back yard frog farm. Right — 3-pound bullfrog.



Small frog farm requires three ponds. Vegetation on shore and in the water is similar to natural haunts of bullfrogs.

Fortunes Await These Needed Inventions

Editor's Note: Questions of readers desiring advice on how to secure patents, or methods of procedure, or on ideas for inventions will be answered when such requests are accompanied by a stamped, self-addressed envelope. Never send models as they can not be accepted. Address all inquiries to Patent Editor, Modern Mechanix and Inventions, 529 South Seventh Street, Minneapolis, Minn.



Small, compact, electrical carpet cleaners are badly needed by housewives. A low cost electrical shoe shiner for the home would be a great seller. The device should be simple. Inventions such as these should bring good returns.

TIME and time again the author of this Department reads either in the scientific press or in the Patent Office Gazette where ideas outlined here have been perfected and commercialized. This proves not only the great alertness of our American inventors and their ingenious solutions of problems but it is at the same time a great source of inspiration to know that this publication is a factor in the development of our industrial life.

Although the vacuum floor sweeper has become immensely popular with housewives, we should not overlook the fact that the lowly carpet sweeper is still largely used and that many women would not be without it. Yet this simple little household tool has not been improved upon for many years. What is needed is a smaller, more compact article electrically driven at high speed and electrically propelled so that the housewife need only guide it about. It is merely a problem in correct design and yet the solution might be worth a tidy fortune.

Take another everyday, ordinary article like the homely bed spring. Where is the inventor who will invent a bed spring in which the individual springs, once they become broken or weak, can be easily removed and replaced with new ones? A fortune awaits just around the corner.

Solid rubber tires have been coming off baby carriage wheels and coasters for many years. The inventor who can solve that problem will probably reap a nice profit.

The records of the United States Patent Office show hundreds of patents relating to door hinges and hinges of other types. There is still to appear a door hinge wherein it would be possible to suspend a door on two ball bearings, one in each hinge and in such a manner that the door would never stick, the hinges would never squeak and the door could swing with the slightest effort. This is just a simple problem of mechanics.

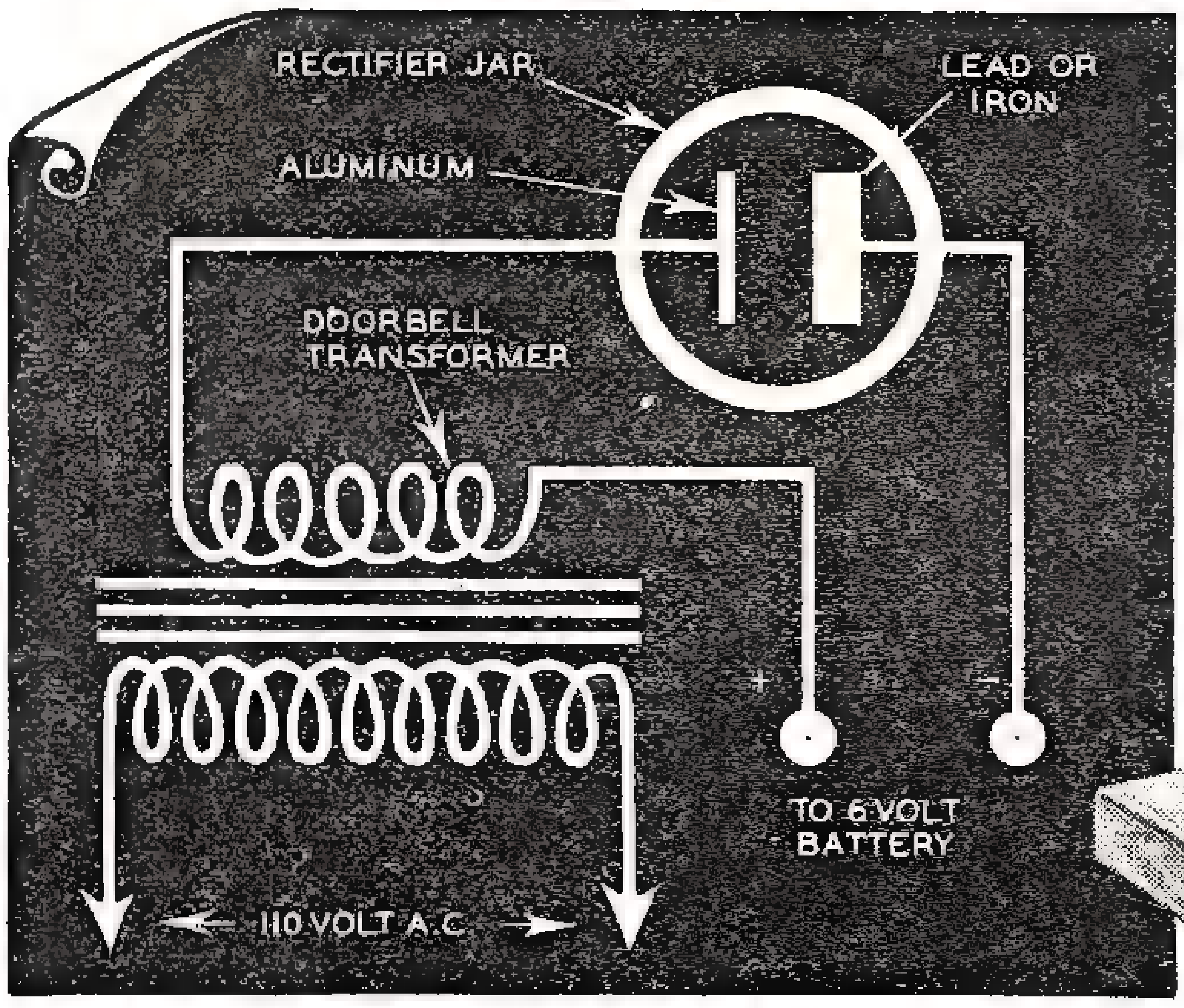
Just a few years back, an inventor stuck a couple of nails into a weiner, connected the nails to a 110-volt circuit and proceeded to cook the weiner from the inside OUT as the current brought to a boil the electrolytic juices formed by the brine. It was first done more or less as a joke but the inventor of the system woke up in the middle of the joke and made himself a lot of money. This self-same system might be used in the preparation of meats of other kinds by first soaking them in brine and designing a cooker in such a way that the current will penetrate all parts of the roast.

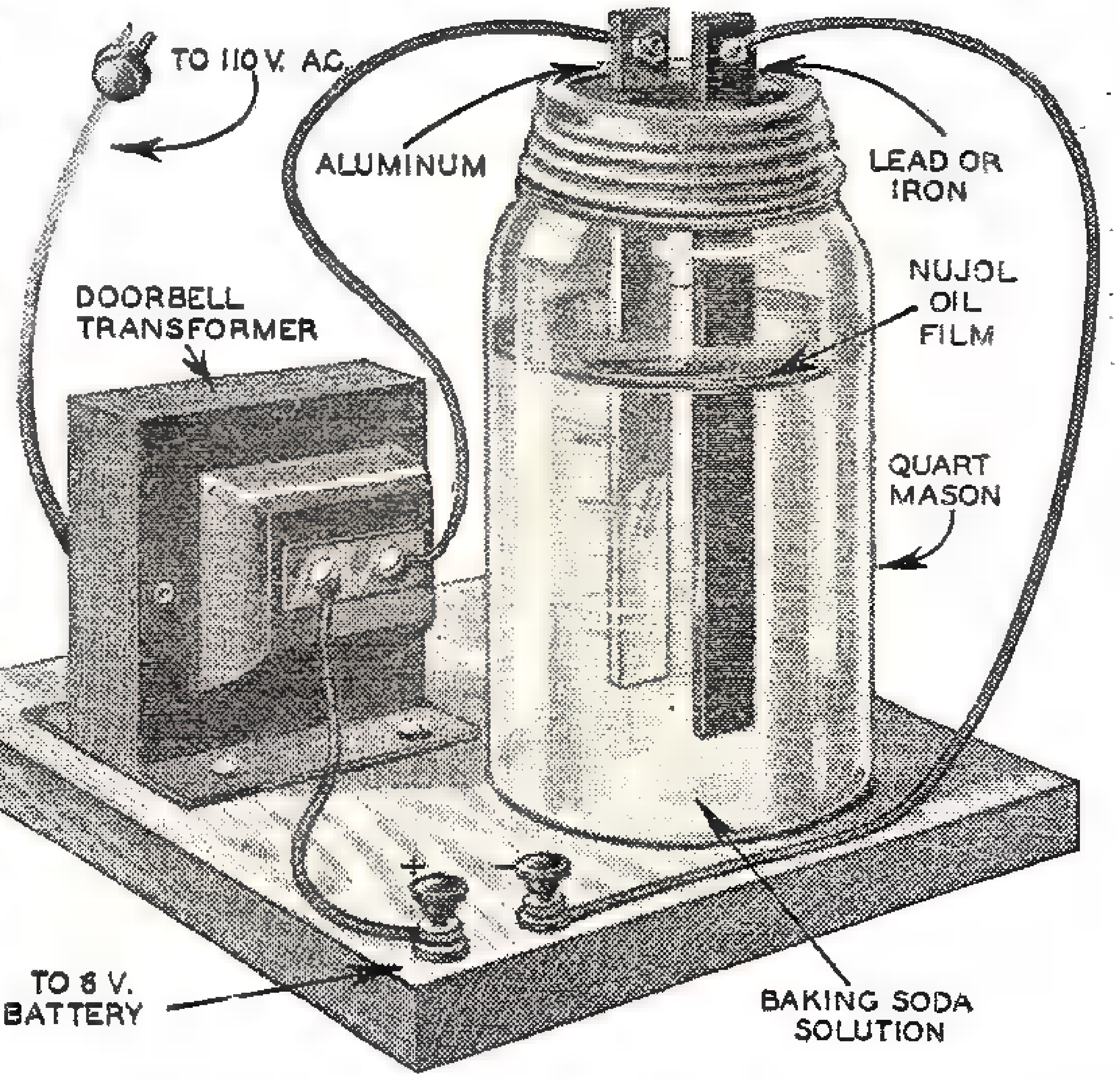
Perhaps one of the most vexing problems of the motorist in the northern climates is that of sleet freezing on the windshield. Quite an old problem indeed and many so-called solutions have been made. However,

(Continued on page 142)

RADIO SPARKS

Make This Simplest Possible Six-volt Battery Charger


RECTIFIER JAR
LEAD OR IRON
ALUMINUM
DOORBELL TRANSFORMER
+
-
TO 6 VOLT BATTERY
110 VOLT A.C.


TO 110 V. AC.
ALUMINUM
LEAD OR IRON
NUJOL OIL FILM
DOORBELL TRANSFORMER
QUART MASON
TO 6 V. BATTERY
BAKING SODA SOLUTION

HERE is the simplest possible storage battery charger. It can be connected to your car or radio battery over night, and in most cases the cells will be fully charged by morning.

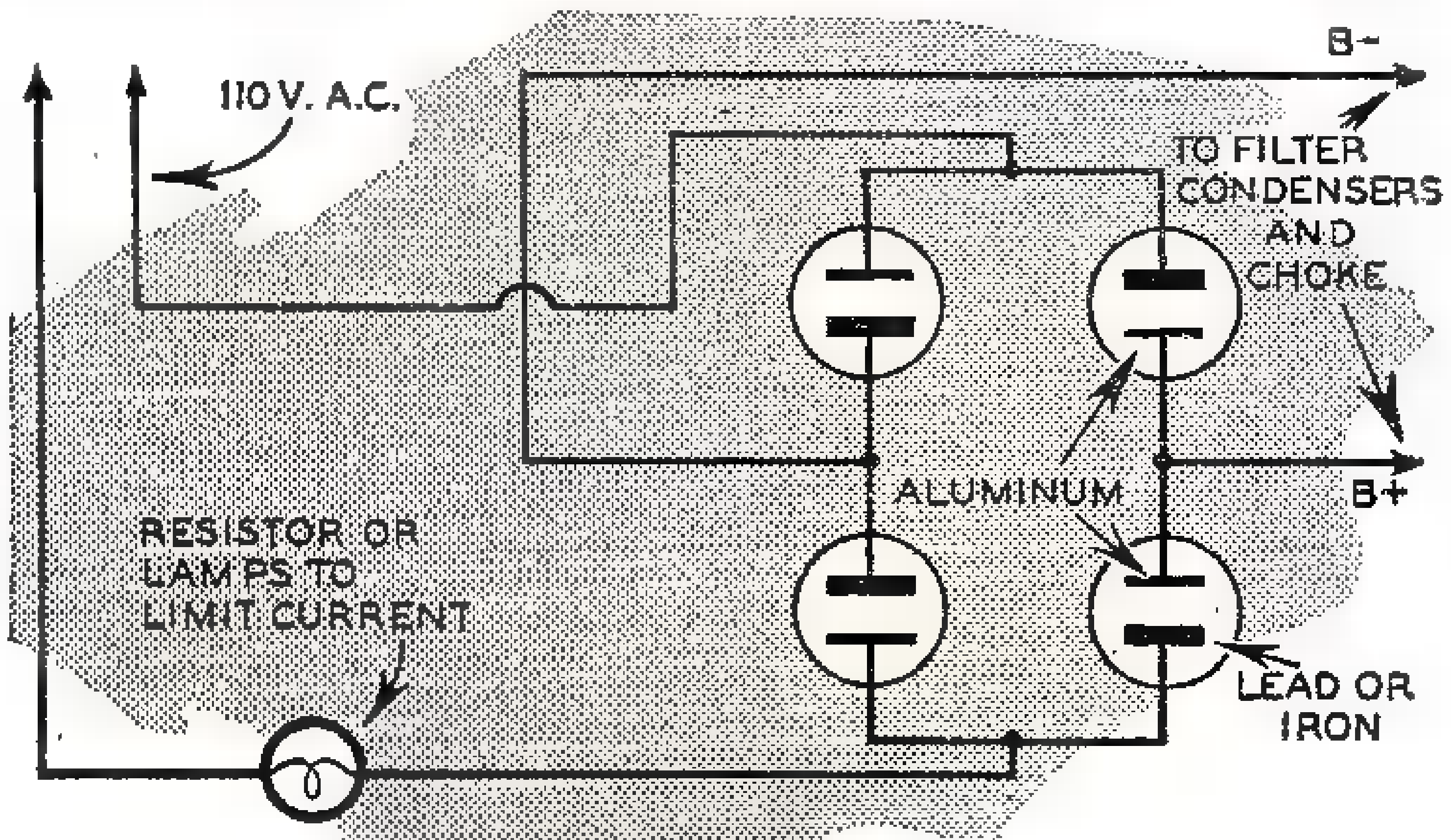
Take a quart Mason jar, cut a large hole in the zinc cover, and insert a fiber or wood insulating disc. Drill holes in the disc to take the electrodes, one being of thick aluminum and the other of iron, copper, or lead. Electrodes are 1"x6", and mounted about one inch apart.

Fill the jar with water to within two inches of the top, and add ordinary baking soda or borax until no more can be dissolved. Pour a film of Nujol oil or crank case oil over the solution to prevent evaporation.

Attach terminal screws to the outer ends of each electrode, and connect as indicated in diagrams to transformer and battery.

You Can Make a Ninety-volt B Battery Eliminator From Scrap Parts

FOUR chemical rectifier cells are used here to obtain full wave rectification of alternating current for a 90 volt radio plate supply. Make each jar exactly as specified for the battery charger above; smaller aluminum plates may be used here, since the output current is smaller than in battery charging.

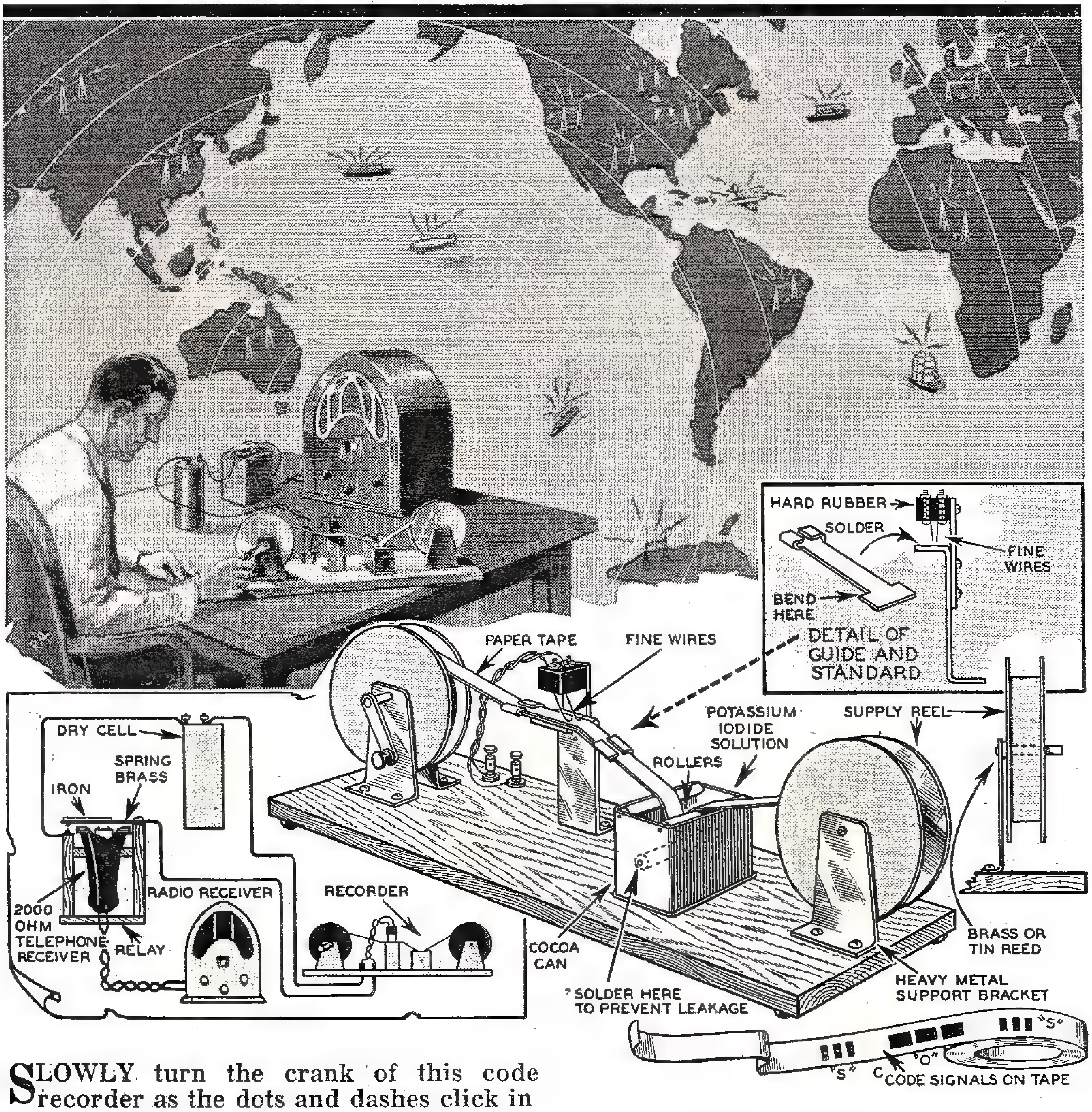

110 V. A.C.
B-
TO FILTER CONDENSERS AND CHOKE
ALUMINUM
B+
RESISTOR OR LAMPS TO LIMIT CURRENT
LEAD OR IRON

Be sure that the cells are arranged as indicated. Connect a small lamp in series with the line when first testing, to limit the initial current surge. After a few minutes the cells will be formed, and the lamp resistance may be reduced or cut out entirely.

Aluminum spoons or strips from aluminum pans can be used for electrodes. These will gradually wear away, but can easily be replaced.

A regular condenser and choke filter unit is needed here, just as with any other type of rectifier.

Catch Coded Radio Messages With Paper Tape Recorder


HARD RUBBER
SOLDER
FINE WIRES
BEND HERE
DETAIL OF GUIDE AND STANDARD
PAPER TAPE
FINE WIRES
POTASSIUM IODIDE SOLUTION
SUPPLY REEL
ROLLERS
DRY CELL
SPRING BRASS
IRON
2000 OHM TELEPHONE RECEIVER
RELAY
RADIO RECEIVER
RECORDER
COCOA CAN
SOLDER HERE TO PREVENT LEAKAGE
HEAVY METAL SUPPORT BRACKET
BRASS OR TIN REED
"S"
"O"
"S"
CODE SIGNALS ON TAPE

SLOWLY turn the crank of this code recorder as the dots and dashes click in on your short wave receiver, and the coded messages will be neatly printed on paper tape. Turn the crank a bit faster, and you can record every click of the high speed machine transmitters, translating the messages at your leisure.

The action of the recorder is based on the fact that a small direct current will decompose potassium iodide, a salt obtainable at any drug store. If a current is passed between two wires touching a paper moistened with this salt, a brown line is drawn.

A tank for the potassium iodide solution is made from a cocoa can. Three wood dowel rollers are mounted to guide the tape through the bath, pins being used for bearings. Solder the pin heads on the outside, and coat the inside of the can with paraffin.

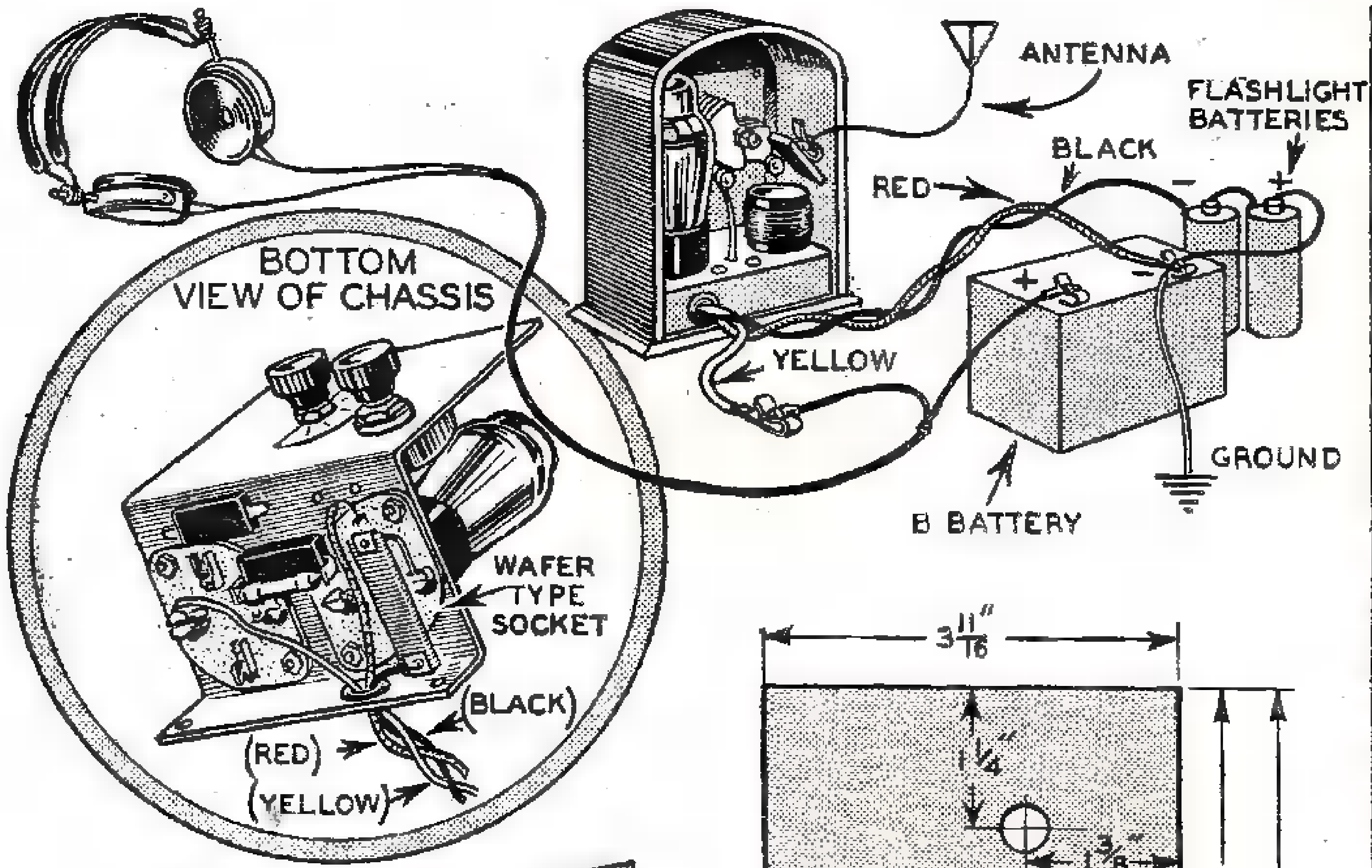
The reels are made from tin, with wood spools for the core.

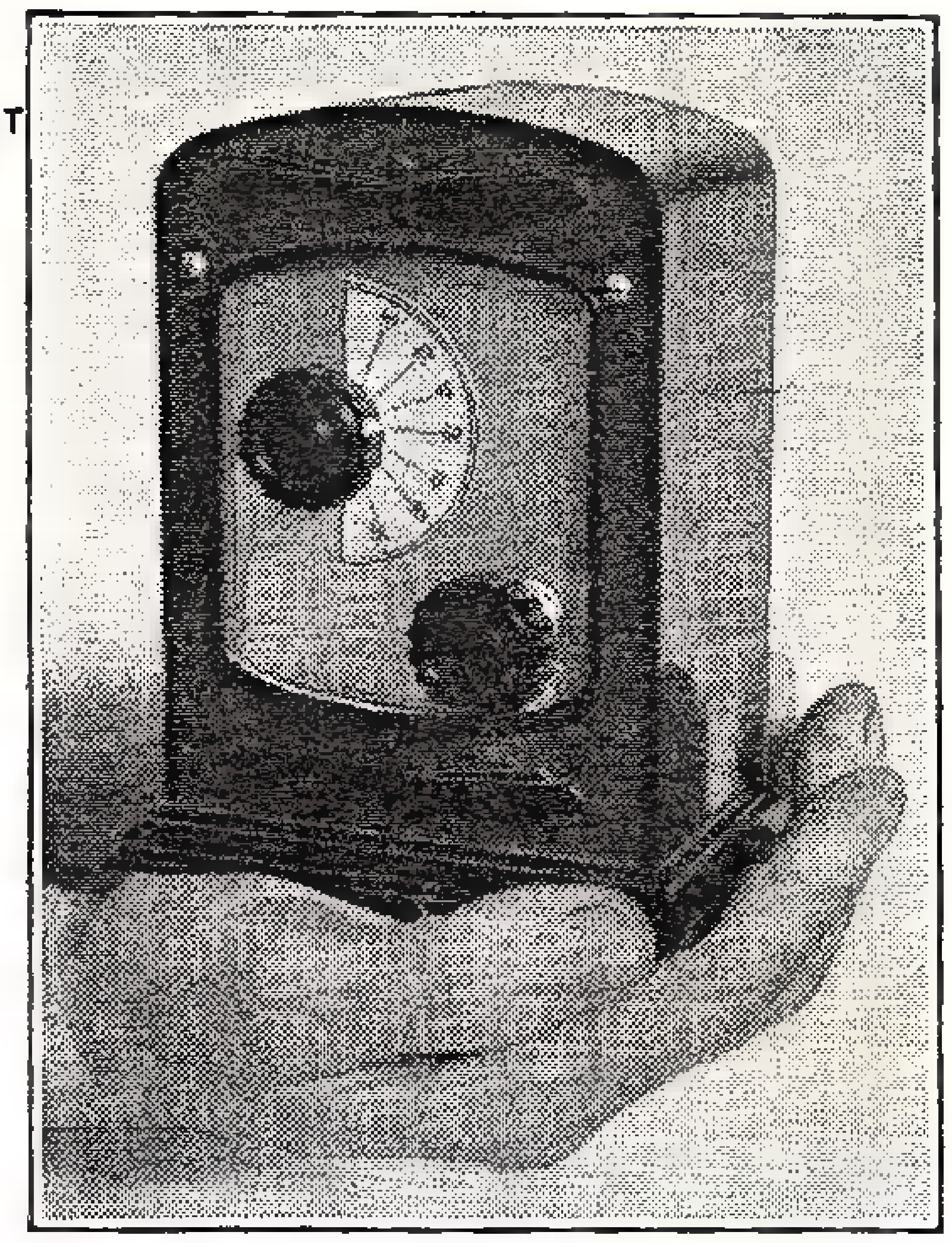
Reel supports can be of heavy gauge sheet metal. The metal standard at the center supports the recording unit and paper tape guides. Two fine iron wires bent in the form of hooks are mounted on a hard rubber or wood block with machine screws. The two wires should not be over 1/32″ apart where they touch the paper tape.

Ticker tape is ideal for the recorder. Rolls of thin wrapping paper can be cut into narrow rolls with a sharp hack saw.

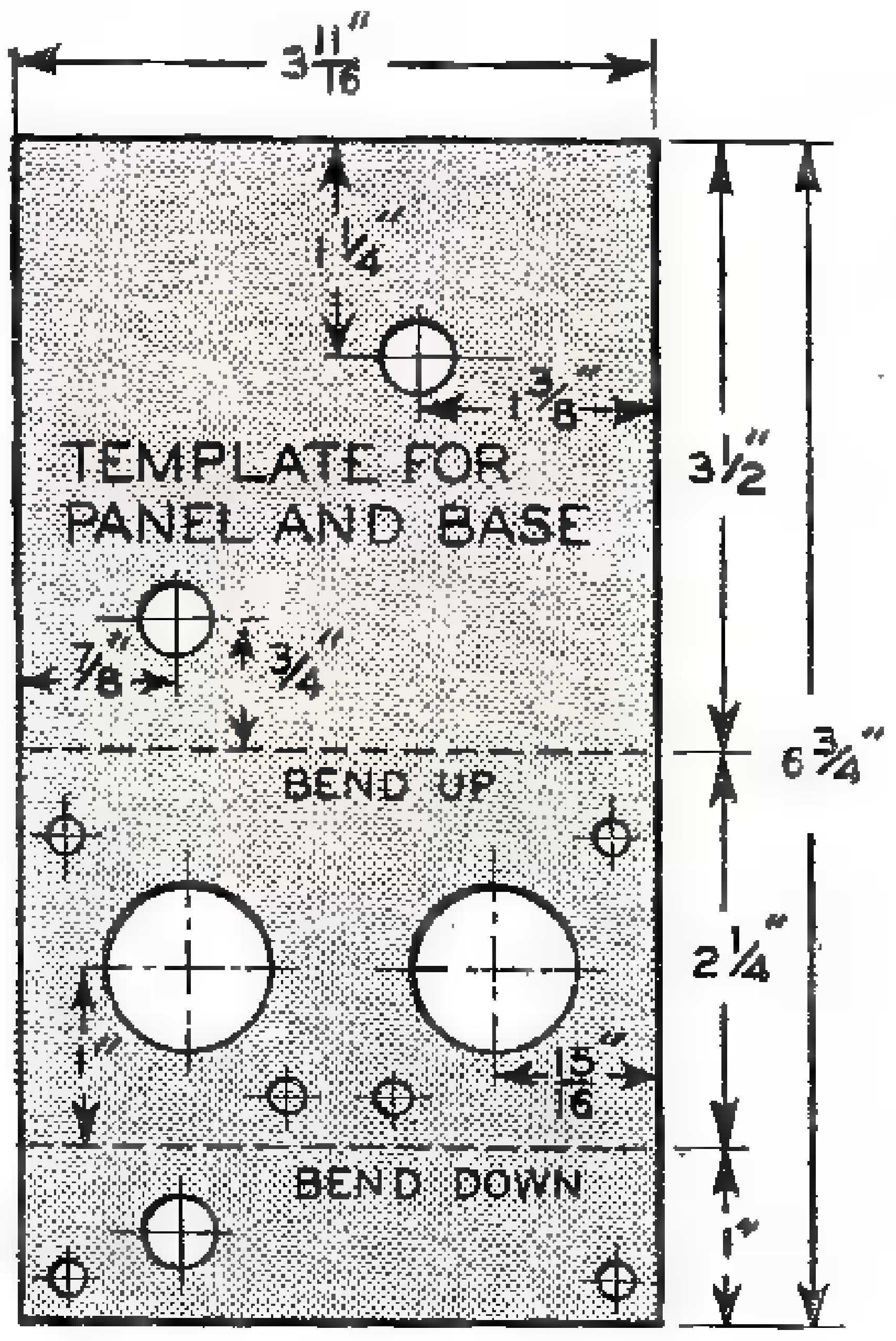
A telephone receiver or even an old head phone will do for the necessary relay. Mount a spring armature over the receiver magnets, so that the contact points will close each time a code signal pulls down the armature. Connect the relay to the speaker terminals of the radio. Place a dry cell in series with recorder points and contacts, and the recorder is ready to use.

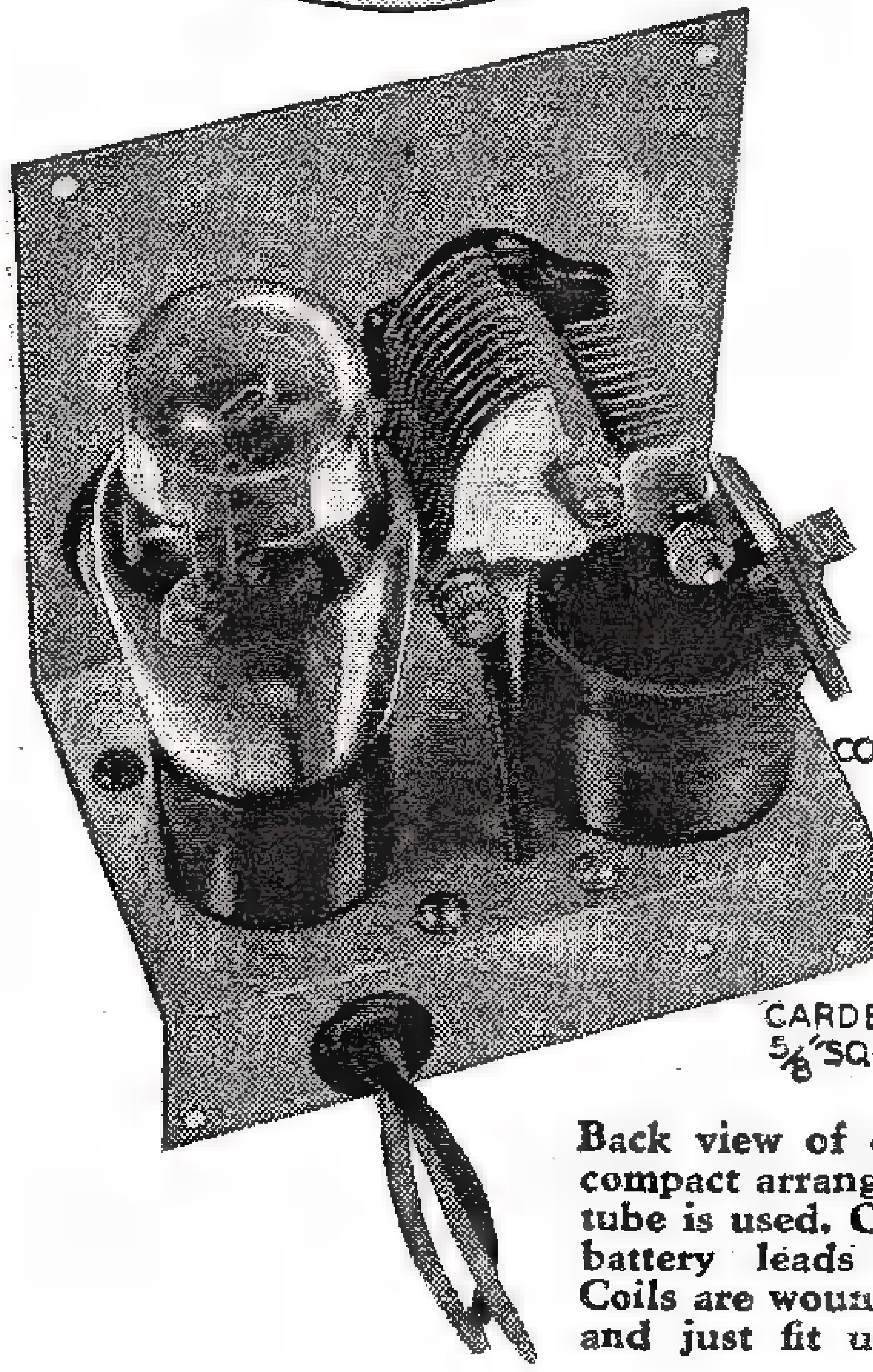
All Wave Radio Marvel Fits in Clock Case

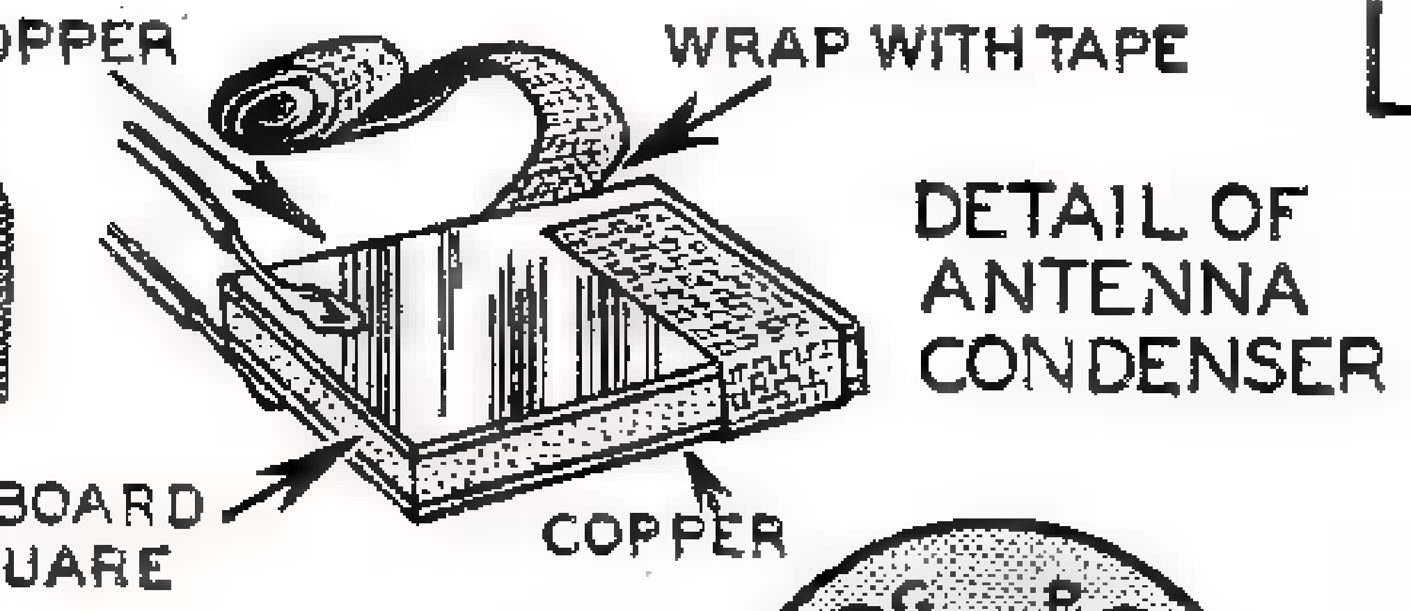

ANTENNA
FLASHLIGHT BATTERIES
BLACK
RED
YELLOW
GROUND
B BATTERY
BOTTOM VIEW OF CHASSIS
WAFER TYPE SOCKET
(BLACK)
(RED)
(YELLOW)



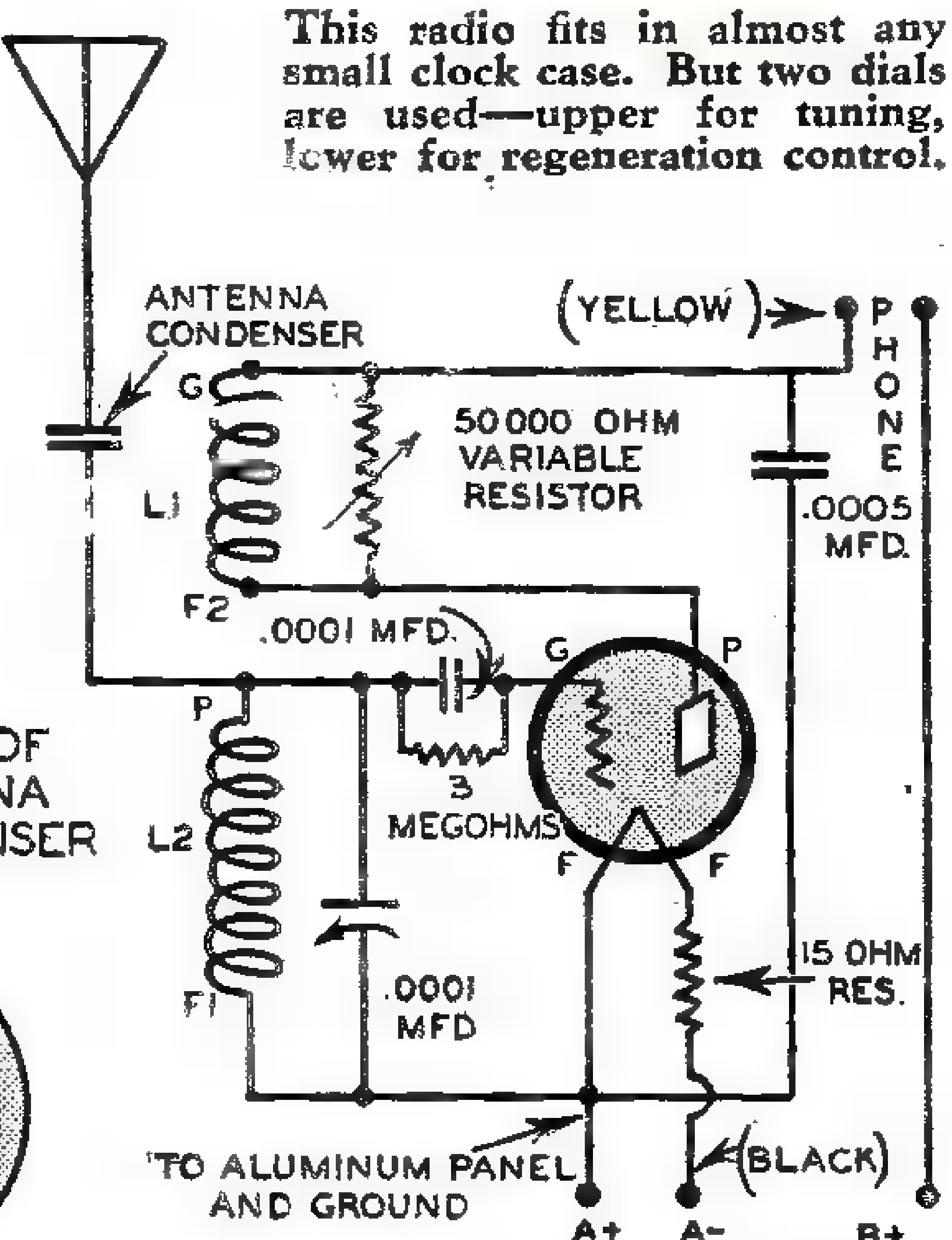
This radio fits in almost any small clock case. But two dials are used—upper for tuning, lower for regeneration control.

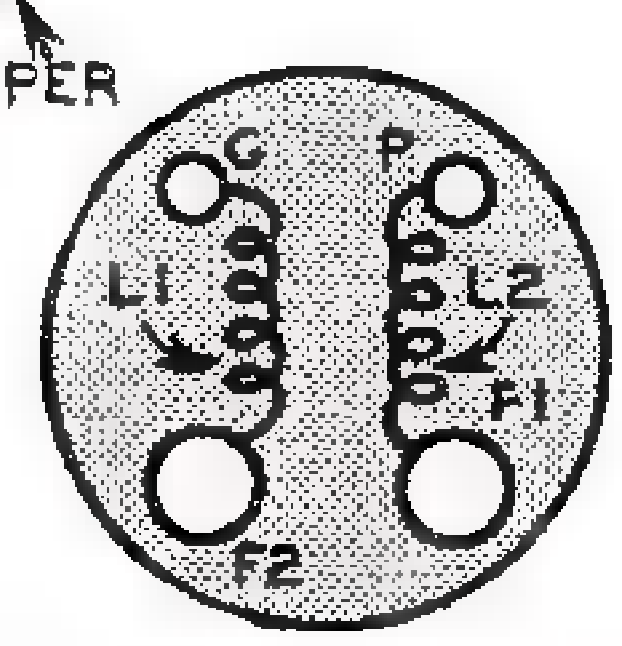

3 11/16"
1 1/4"
1 3/8"
TEMPLATE FOR PANEL AND BASE
3 1/2"
7/8
3/4"
BEND UP
6 3/4"
2 1/4"
1"
15/16"
BEND DOWN
1"

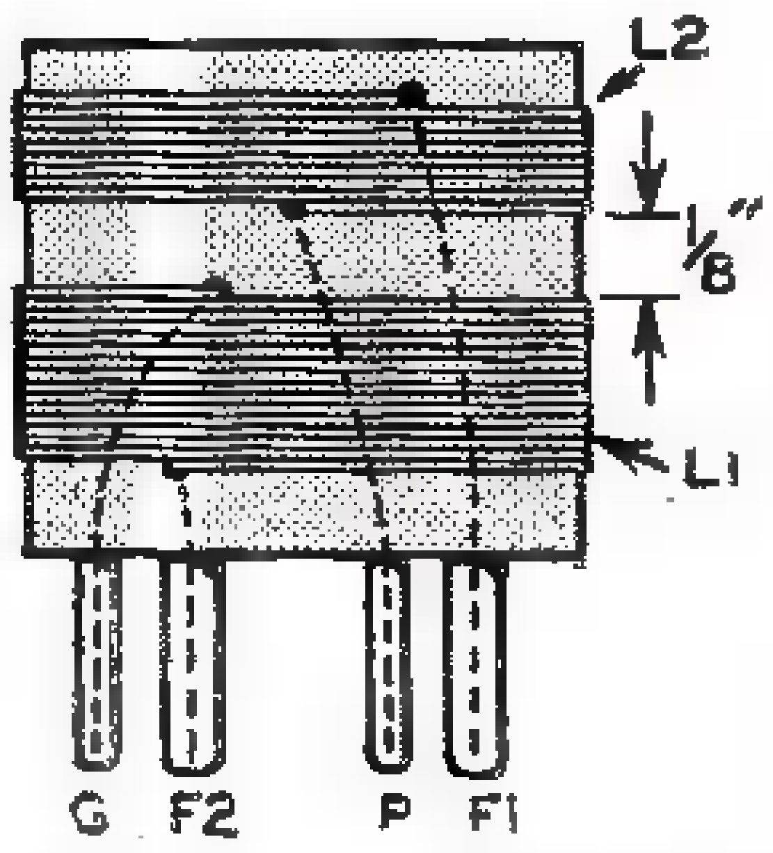



COPPER
WRAP WITH TAPE
DETAIL OF ANTENNA CONDENSER
CARDBOARD 5/8" SQUARE
COPPER

Back view of chassis, showing compact arrangement. Type 30 tube is used. Only aerial and 3 battery leads run from set. Coils are wound [redacted] tube bases, and just fit under condenser.


ANTENNA CONDENSER
G
L1
F2
50000 OHM VARIABLE RESISTOR
(YELLOW)
PHONE
.0005 MFD.
.0001 MFD.
G
P
P
3 MEGOHMS
L2
F
F
.0001 MFD
F1
15 OHM RES.
TO ALUMINUM PANEL AND GROUND
(BLACK)
A+
A-
B-
(RED)
B+
45 OR 90 VOLT B BATTERY


G
P
L1
L2
F1
F2


L2
1/8"
L1
G
F2
P
F1

COIL DATA

COIL	METERS		L1 TURNS	L2 TURNS
1	14	25	4	6
2	23	41	7	9
3	40	85	14	12
4	83	125	23	23
5	120	[redacted]	36	36
6	200	[redacted]	64	64
7	350	550	104	104

Coils wound with No. 34 enameled copper wire. Wind L1 and L2 in same direction. Reverse P and F1 if receiver will not oscillate. Coils [redacted] and 7 are for broadcast band, 5 for police and airplane, others for short wave amateurs.

HERE'S a dandy one tube set that'll bring in the distance on either short or long waves. It uses headphones, eliminating those noisy DX squeals so annoying to the family, and will fit in a clock case.

All parts are on a 1/32" aluminum sheet bent to form both chassis and panel. Drill holes as indicated, and bend panel to shape. Mount wafer type sockets diagonally so that large "F" holes are toward the lower front corners of set.

The tuning control, [redacted] .0001 mfd. midget variable condenser (23 plates) is mounted in center. A 50,000 ohm variable resistance goes in front of tube socket. Antenna condenser may either be bought or made. Tube is type 30.

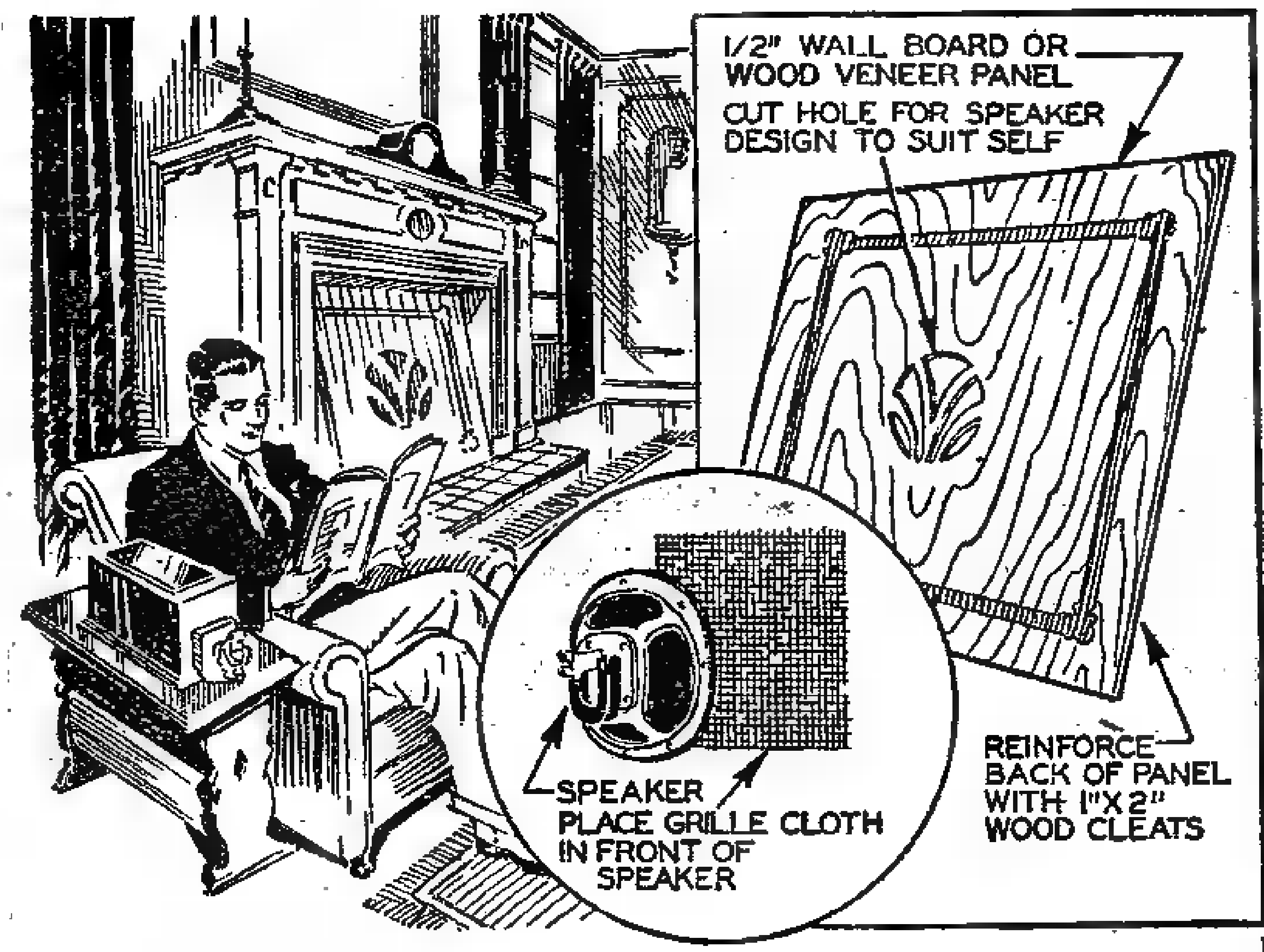
Mount midget fixed condensers, grid leak, and 15 ohm filament resistor under chassis.

All connections in A+ B— circuit go to the chassis. Make all wiring short.

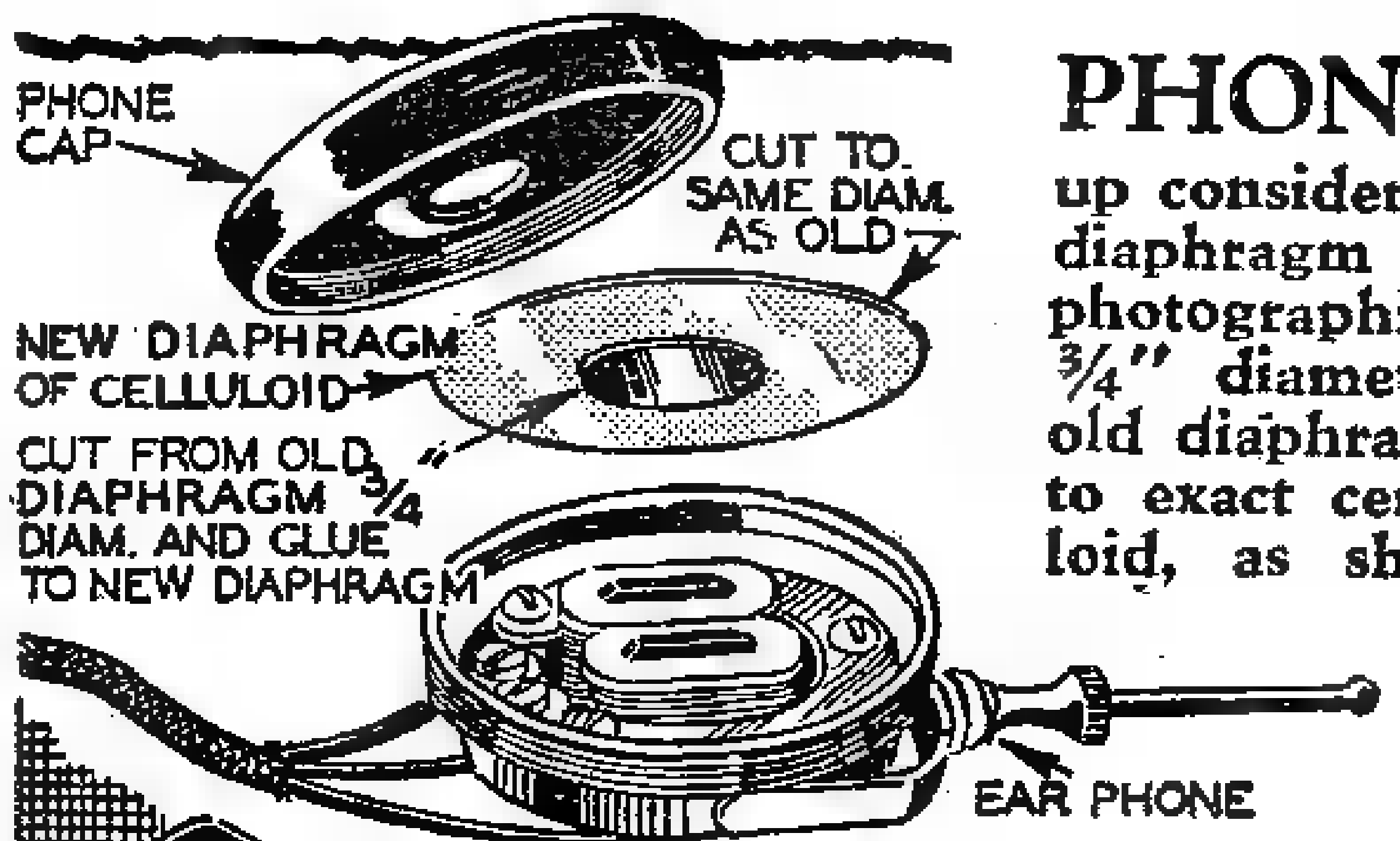
Two flashlight cells will last several weeks as A batteries.

To operate this regenerative receiver, turn knob on tuning control until plates are closed. Slowly turn potentiometer until a "plop" is heard. Turn past this point, and go back until set is about ready to "plop" again. Now turn tuning control until a station is heard.—Thomas A. Blanchard.

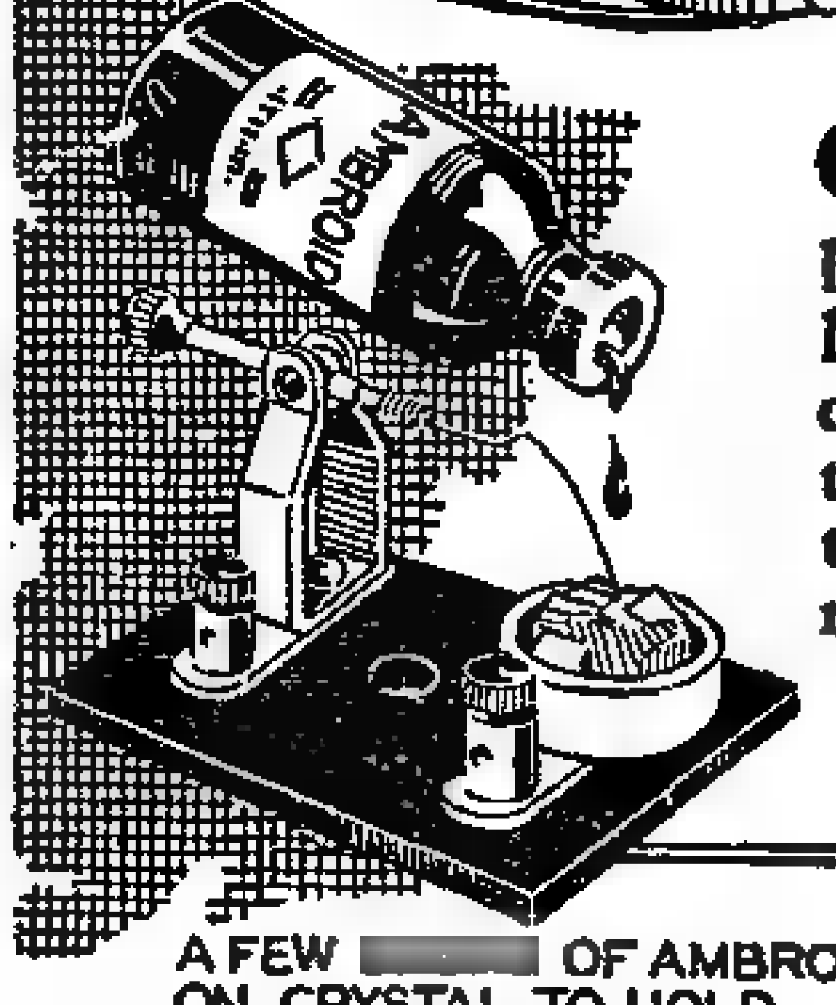
New IDEAS for the Radio Experimenter


1/2" WALL BOARD OR WOOD VENEER PANEL
CUT HOLE FOR SPEAKER DESIGN TO SUIT SELF
REINFORCE BACK OF PANEL WITH 1"X2" WOOD CLEATS
SPEAKER
PLACE GRILLE CLOTH IN FRONT OF SPEAKER

FIREPLACE SPEAKER is ideal for homes having unused fireplaces. Get [illegible] sheet of ½" wallboard [illegible] plyboard that will just fit in fireplace opening. Cut [illegible] circular hole in center, to a size a bit smaller than rim of cone speaker. Mount speaker [illegible] panel, and run wires out through small hole in bottom corner of board. Glue grille cloth over opening in panel to improve appearance.


PHONE CAP
CUT TO SAME DIAM. AS OLD
NEW DIAPHRAGM OF CELLULOID
CUT FROM OLD DIAPHRAGM ¾" DIAM. AND GLUE TO NEW DIAPHRAGM
EAR PHONE

PHONES can be pepped up considerably by using diaphragm cut from old photographic film. Cut ¾" diameter disc from old diaphragm, and glue to exact center of celluloid, as shown at left.


AMBROID
A FEW [illegible] OF AMBROID ON CRYSTAL TO HOLD CAT WHISKER IN FIXED POSITION

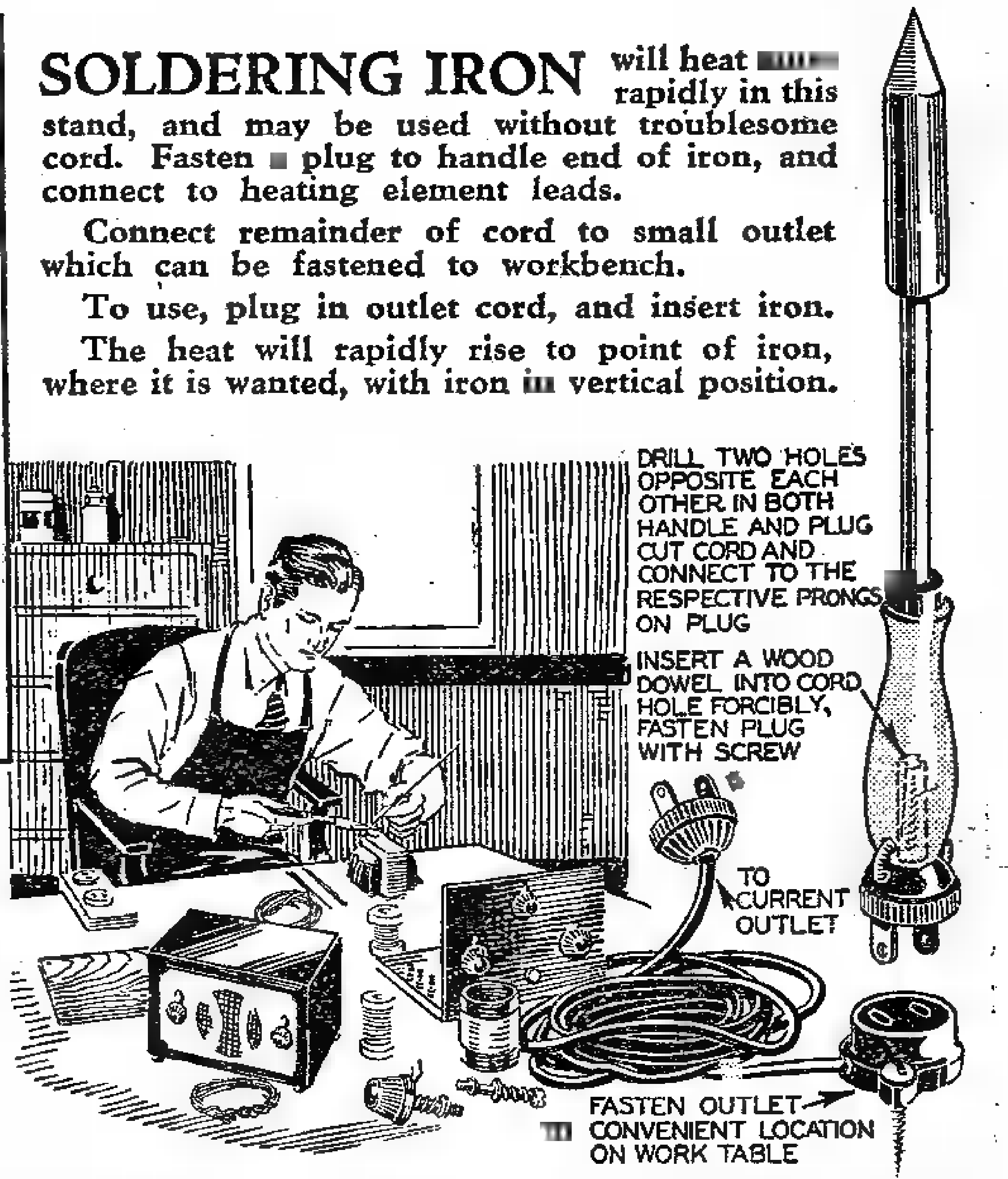
CRYSTAL detector can be "fixed for good" by adjusting cat whisker [illegible] the loudest point, and placing [illegible] few drops of Ambroid cement around this point. When dry [illegible] more tickling of the crystal will be necessary.

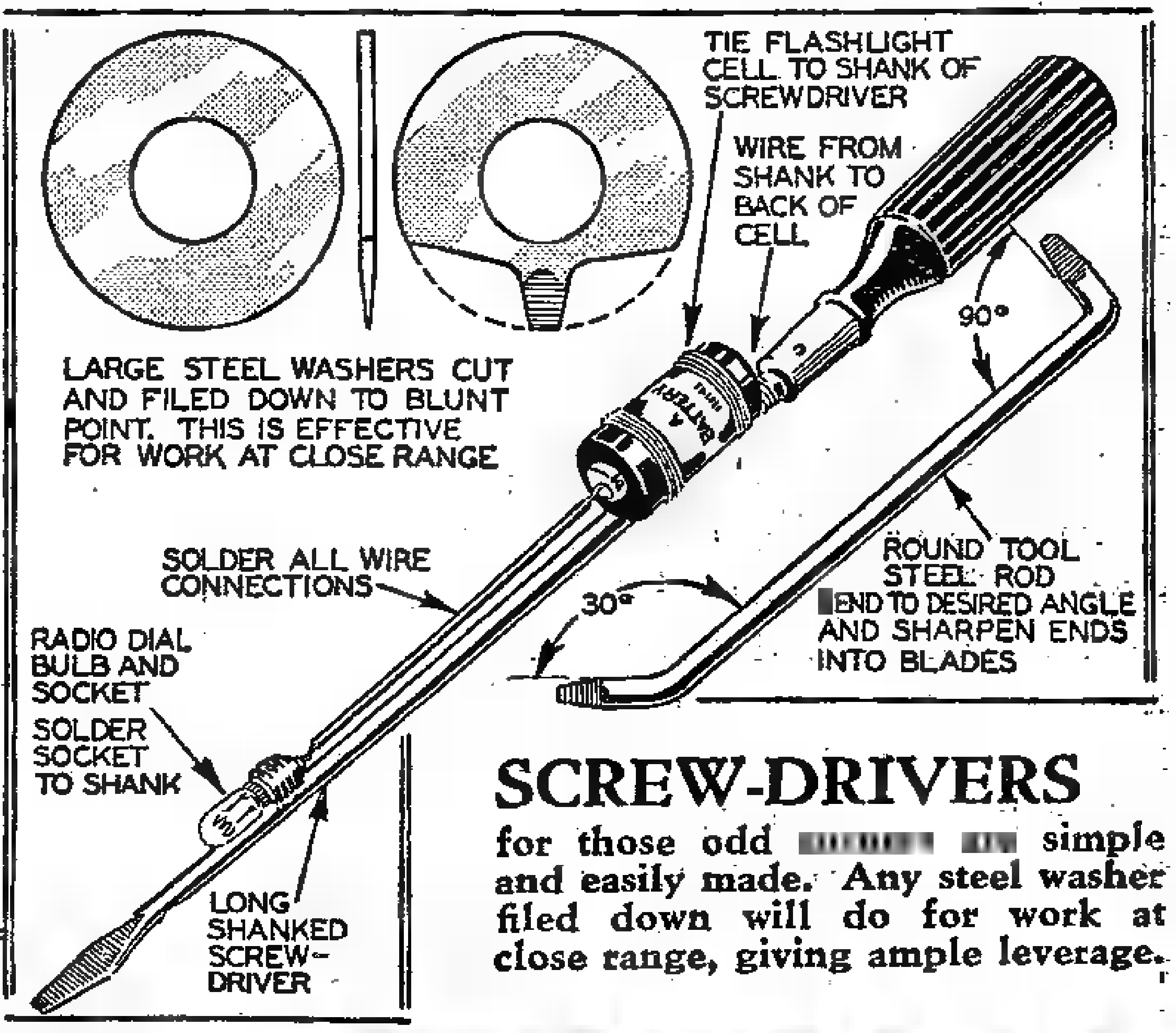
SOLDERING IRON will heat [illegible] rapidly in this stand, and may be used without troublesome cord. Fasten [illegible] plug to handle end of iron, and connect to heating element leads.

Connect remainder of cord to small outlet which can be fastened to workbench.

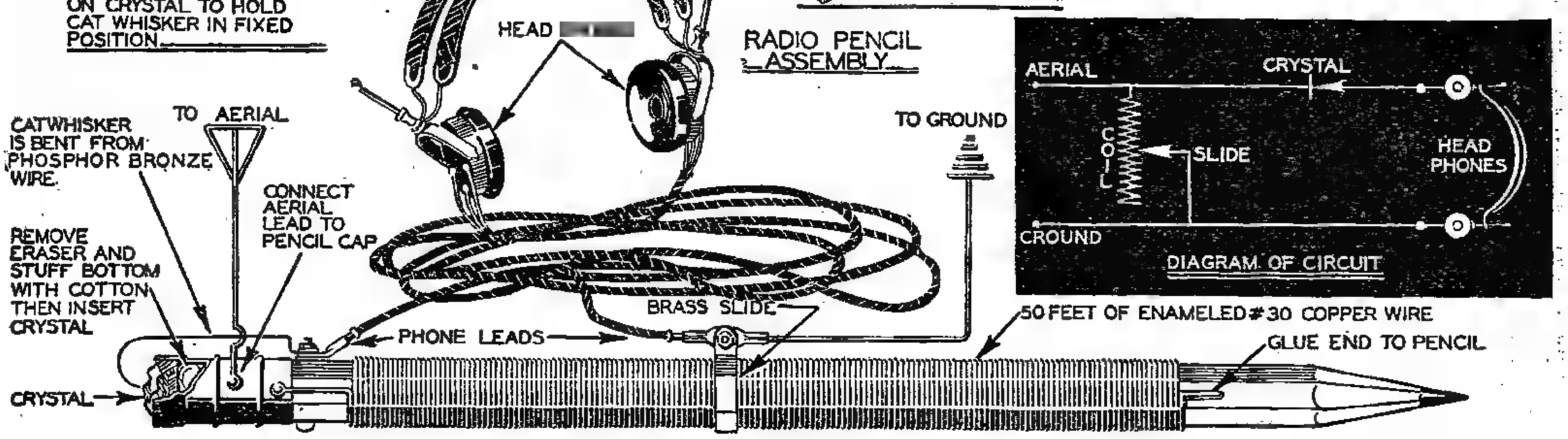
To use, plug in outlet cord, and insert iron.

The heat will rapidly rise to point of iron, where it is wanted, with iron [illegible] vertical position.


DRILL TWO HOLES OPPOSITE EACH OTHER IN BOTH HANDLE AND PLUG CUT CORD AND CONNECT TO THE RESPECTIVE PRONGS ON PLUG
INSERT A WOOD DOWEL INTO CORD HOLE FORCIBLY, FASTEN PLUG WITH SCREW
TO CURRENT OUTLET
FASTEN OUTLET [illegible] CONVENIENT LOCATION ON WORK TABLE


LARGE STEEL WASHERS CUT AND FILED DOWN TO BLUNT POINT. THIS IS EFFECTIVE FOR WORK AT CLOSE RANGE
TIE FLASHLIGHT CELL TO SHANK OF SCREWDRIVER
WIRE FROM SHANK TO BACK OF CELL
90°
SOLDER ALL WIRE CONNECTIONS
30°
ROUND TOOL STEEL ROD [illegible]END TO DESIRED ANGLE AND SHARPEN ENDS INTO BLADES
RADIO DIAL BULB AND SOCKET
SOLDER SOCKET TO SHANK
LONG SHANKED SCREW-DRIVER

SCREW-DRIVERS for those odd [illegible] [illegible] simple and easily made. Any steel washer filed down will do for work at close range, giving ample leverage.

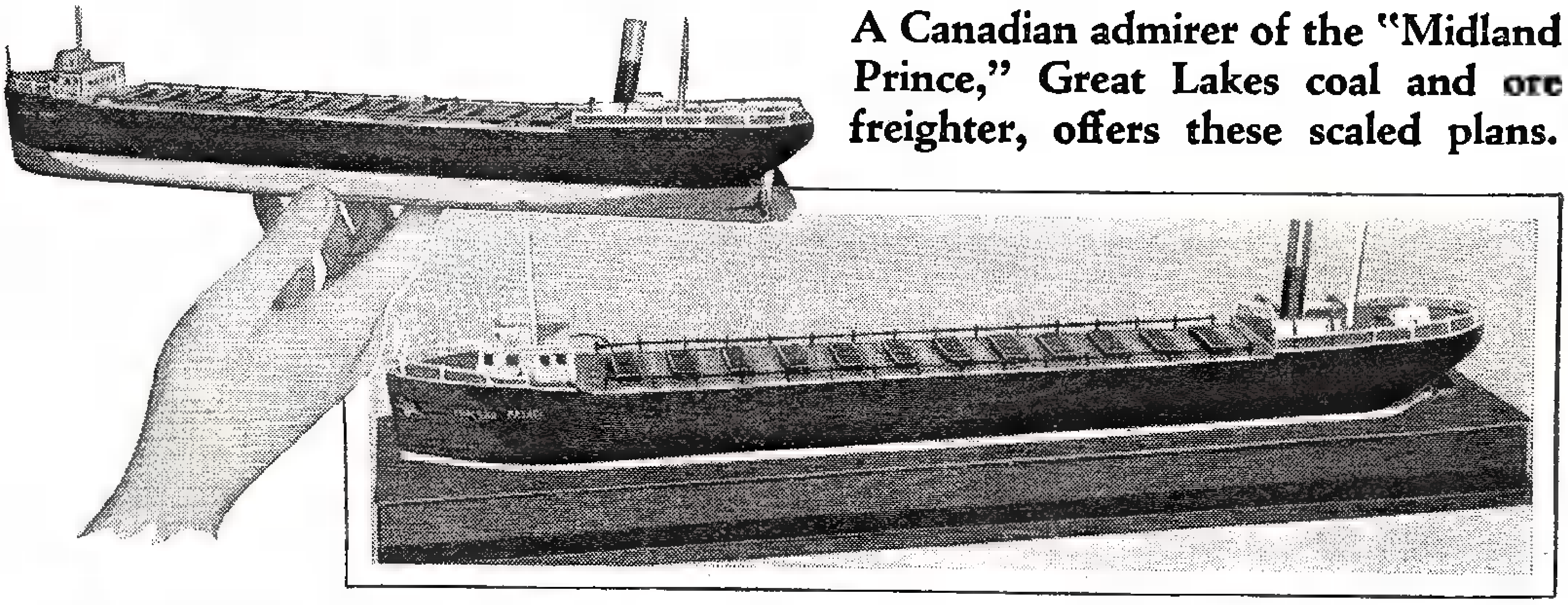

HEAD [illegible]
RADIO PENCIL ASSEMBLY
TO GROUND
CATWHISKER IS BENT FROM PHOSPHOR BRONZE WIRE.
TO AERIAL
CONNECT AERIAL LEAD TO PENCIL CAP
REMOVE ERASER AND STUFF BOTTOM WITH COTTON THEN INSERT CRYSTAL
CRYSTAL
PHONE LEADS
BRASS SLIDE
50 FEET OF ENAMELED #30 COPPER WIRE
GLUE END TO PENCIL
AERIAL
CRYSTAL
COIL
SLIDE
HEAD PHONES
GROUND
DIAGRAM OF CIRCUIT

CRYSTAL SET designed by T. A. Blanchard is built on ⅜" diameter novelty pencil. Solder the top lead of the coil to the metal cap, and simply glue bottom end to the pencil. Remove eraser, push wad of cotton into bottom of cap, and insert [illegible] mounted crystal. Bend cat whisker from a length of phosphor bronze wire, and hold in place with bolt going through wood part of pencil. Scrape the enamel off [illegible] narrow strip of the coil, so that slide makes contact.

To use, connect aerial, ground, and headphones, move slider and adjust crystal until stations are heard.

A Pocketknife Model of a Coal Freighter

A Canadian admirer of the "Midland Prince," Great Lakes coal and ore freighter, offers these scaled plans.



This pocketknife model of the "Midland Prince" will look well on any mantel or desk. She can be mounted in a cardboard cradle like that shown in lower view. Great ships like this are to be seen everywhere on the Great Lakes, carrying coal from Pennsylvania mines to distributing points in the mid-western states, and bringing back to eastern smelters cargoes of Minnesota iron ore.

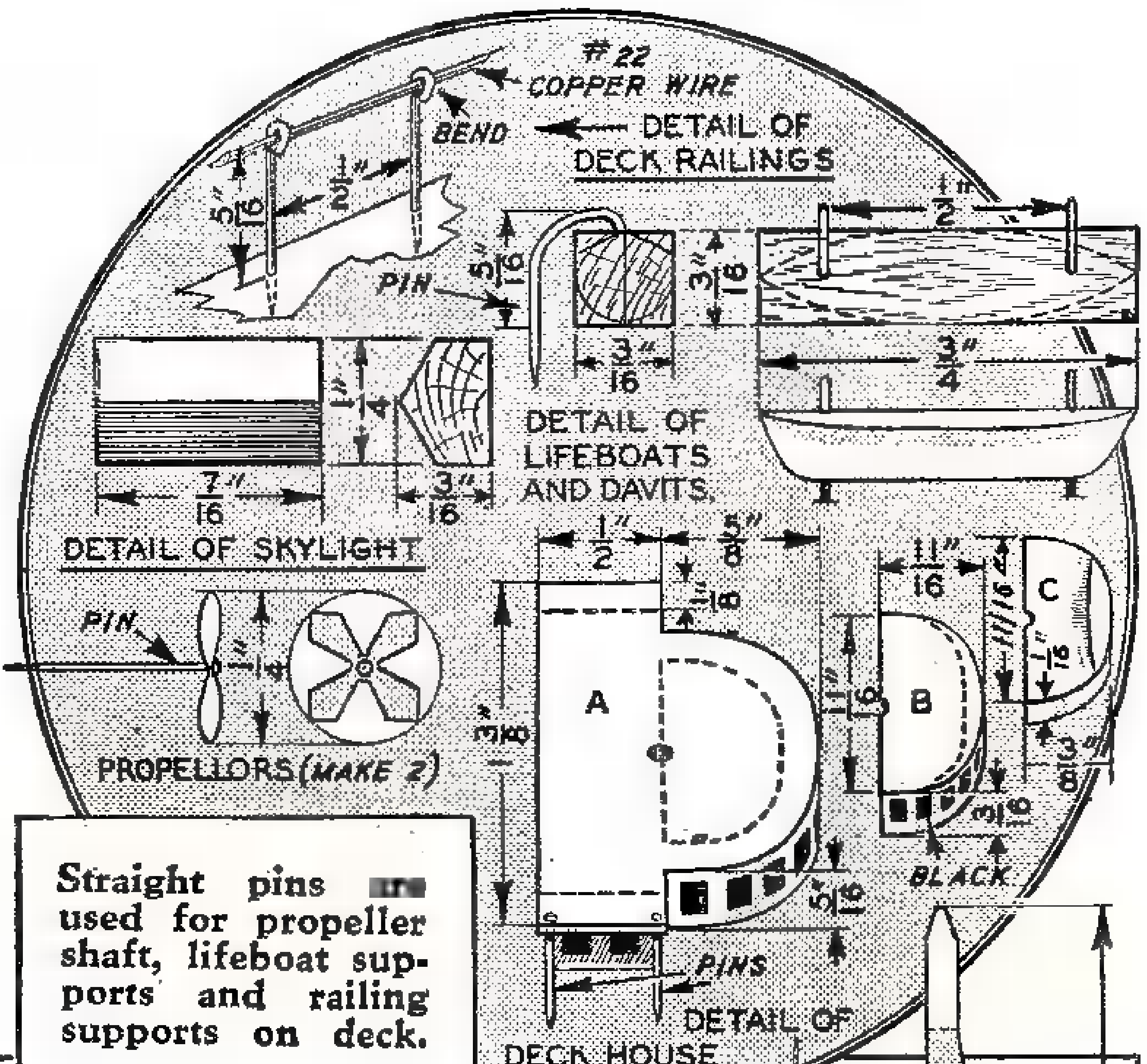
REMINISCENT of the great ships carrying iron ore from Minnesota's mines to smelters along Lake Erie, and returning with coal is this little model of the Great Lakes freighter "Midland Prince."

Soft pine or basswood is sawed and carved out for hull, deck houses, hatches, lifeboats, ventilators, and smokestack.

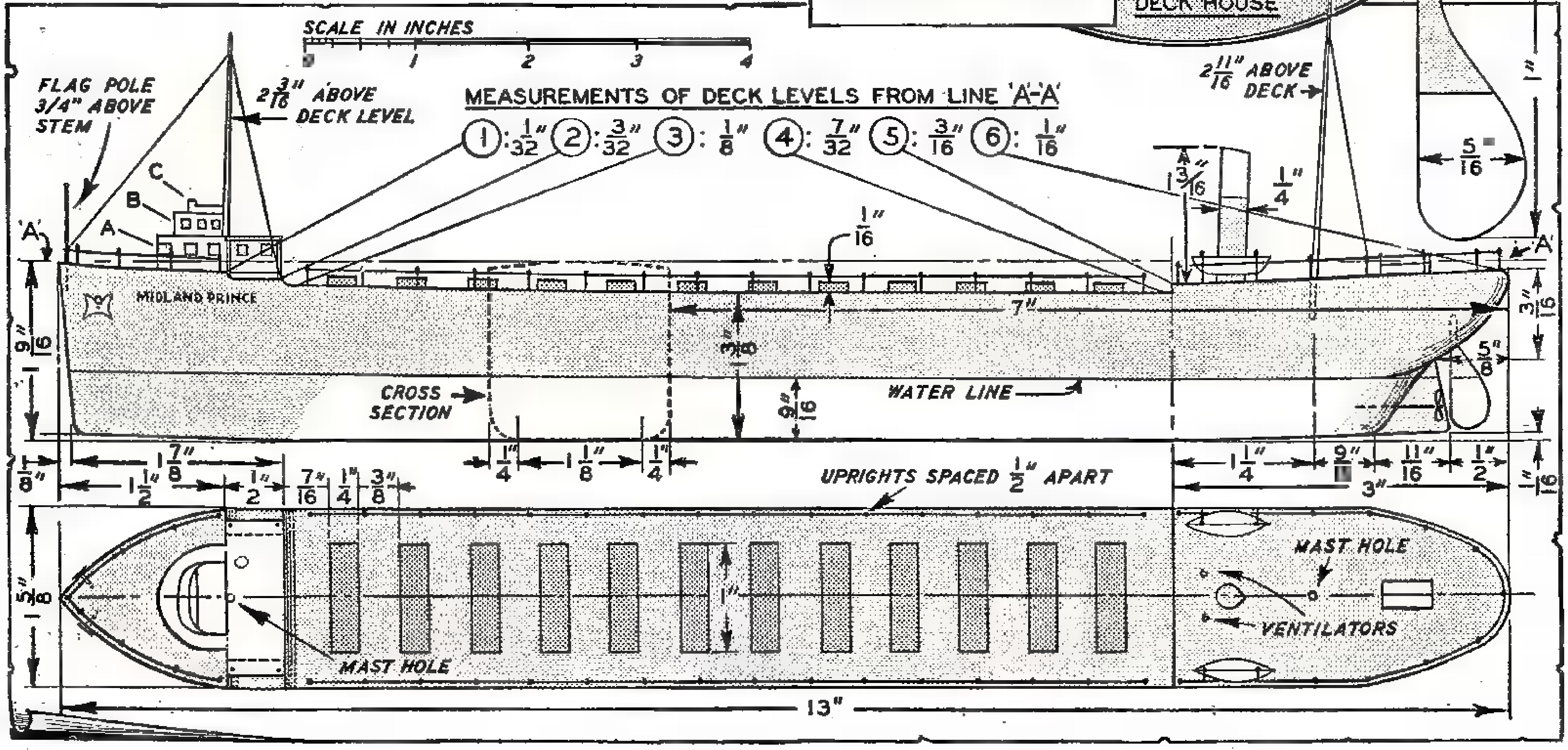
When the hull is completely carved and sandpapered, make the captain's quarters on the prow, and glue to the deck. Twelve hatches are cut out and glued on deck level No. 3. The smokestack is cut from dowel rod, and the masts from candy sticks.

Propellers, rudder, and anchors are cut from thin aluminum or other sheet metal. Masts are rigged with strong black thread.

First give the model a coat of flat white paint. Then paint bottom up to water line, ventilators, and upper part of smokestack a Chinese red. Hull above water line, hatches, posts, railing, and lower part of smokestack should be black, and the remaining portions white.

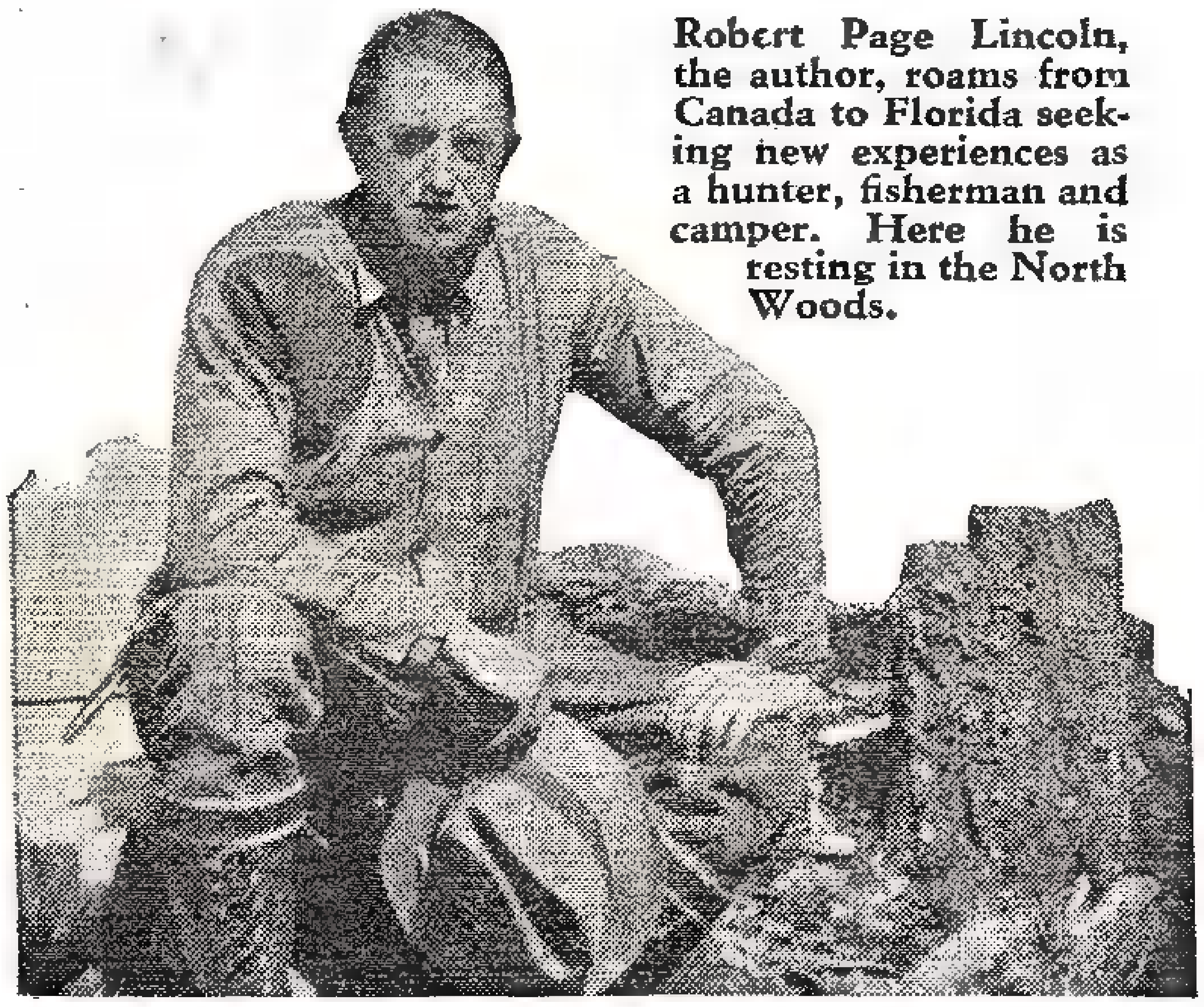

#22 COPPER WIRE
BEND
DETAIL OF DECK RAILINGS
5/16"
1/2"
PIN
5/16"
3/16"
3/16"
1/2"
3/4"
DETAIL OF LIFEBOATS AND DAVITS
1/4"
7/16"
3/16"
DETAIL OF SKYLIGHT
PIN
1/4"
PROPELLORS (MAKE 2)
1/2"
5/8"
1/16"
11/16"
11/16"
1/8"
A
B
C
3/8"
3/16"
BLACK
PINS
DETAIL OF DECK HOUSE

Straight pins are used for propeller shaft, lifeboat supports and railing supports on deck.


SCALE IN INCHES
0
1
2
3
4
FLAG POLE 3/4" ABOVE STEM
2 3/16" ABOVE DECK LEVEL
MEASUREMENTS OF DECK LEVELS FROM LINE 'A-A'
①: 1/32" ②: 3/32" ③: 1/8" ④: 7/32" ⑤: 3/16" ⑥: 1/16"
2 11/16" ABOVE DECK
C
B
A
'A'
'A'
1 3/16"
1/4"
1/16"
MIDLAND PRINCE
7"
9/16"
3/8"
9/16"
3/16"
5/8"
1"
5/16"
CROSS SECTION
WATER LINE
1/8"
1 7/8"
1 1/2"
1/2"
7/16"
1/4"
3/8"
1/4"
1/8"
1/4"
UPRIGHTS SPACED 1/2" APART
1 1/4"
9/16"
11/16"
1/2"
3"
1/16"
1 5/8"
1"
MAST HOLE
MAST HOLE
VENTILATORS
13"

Plan and profile views of "Midland Prince." Hull is carved out of 13" x 1⅝" x 1 9/16" soft pine or basswood. Deck levels can be cut with coping saw and smoothed down with file and sandpaper. Two lifeboats swing from davits.

SPORTSMEN'S Light Tents



Robert Page Lincoln, the author, roams from Canada to Florida seeking new experiences as a hunter, fisherman and camper. Here he is resting in the North Woods.

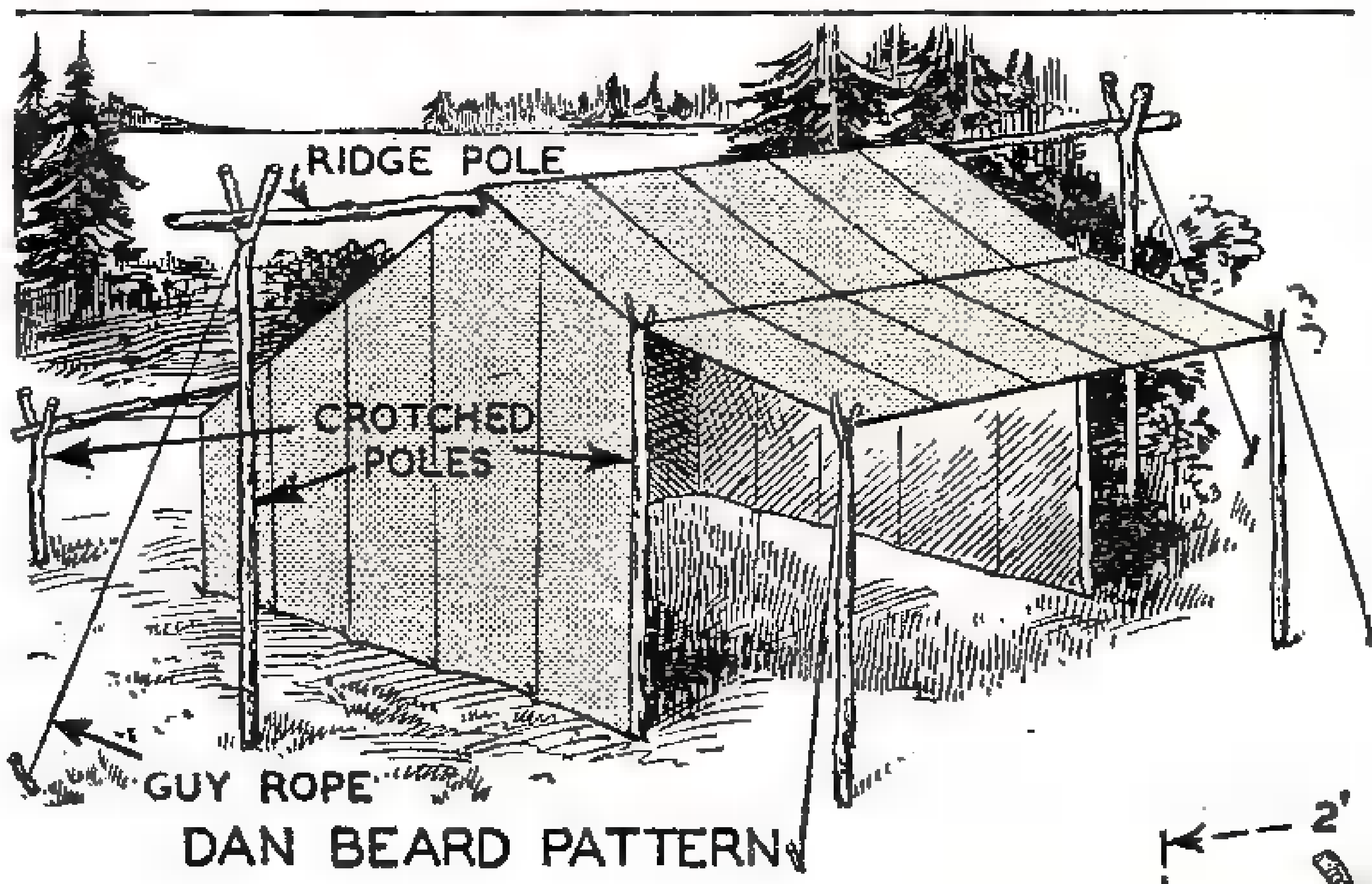
by ROBERT PAGE LINCOLN

Hunting and Fishing Editor

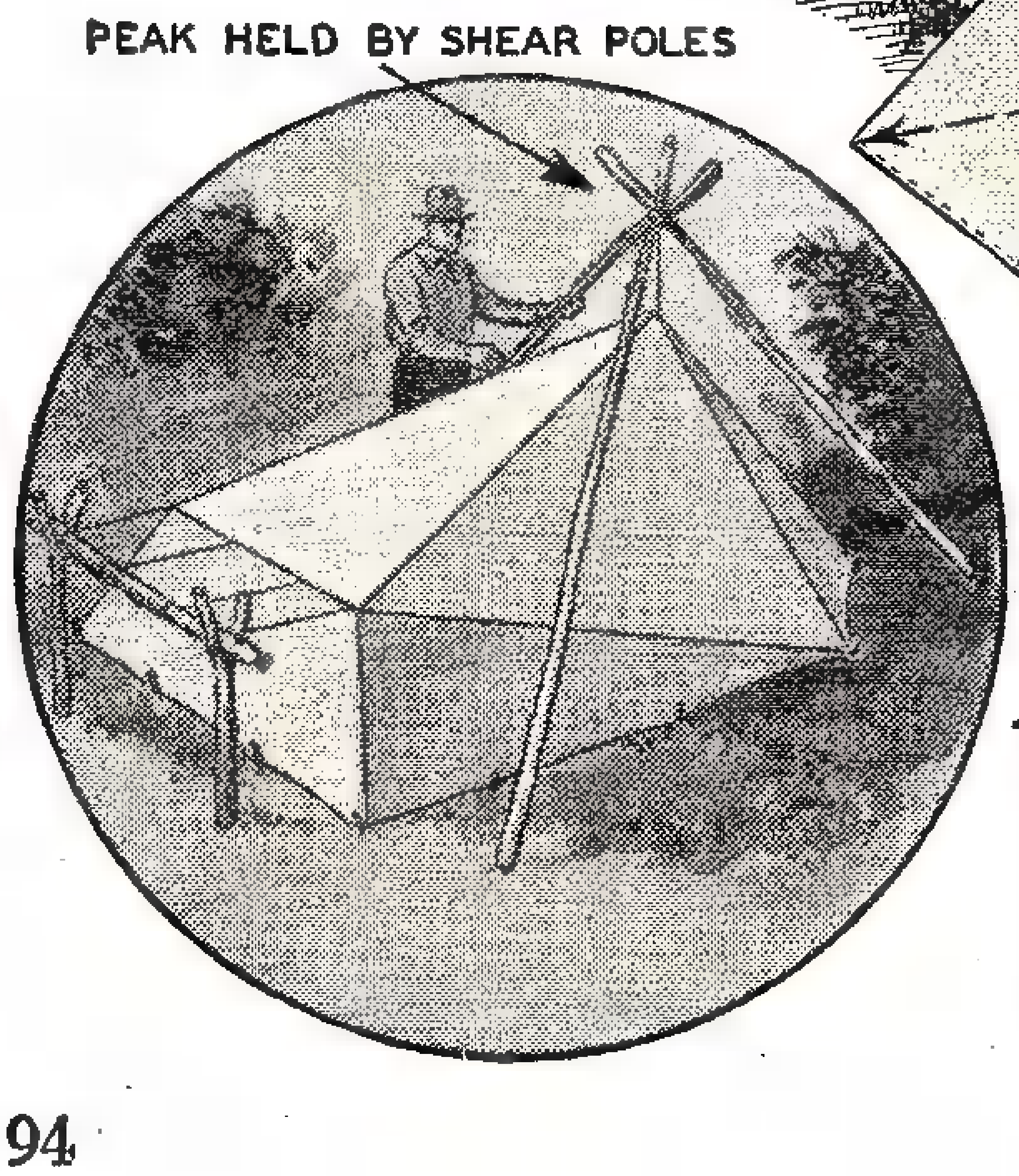
IN MANY ways the little shelter tent, in any one of many designs and patterns, cut and slant, is the most interesting of the canvas roofs open to the purchase of the camping enthusiast. There are those who look upon these tiny tents as suitable for children only, forgetting that the go-light camper, who carries his "all" on his back in a pack-sack, the canoeist, the mountain wanderer and over-night camper who does not wish to be burdened down with a more commodious affair, selects the shelter tent.

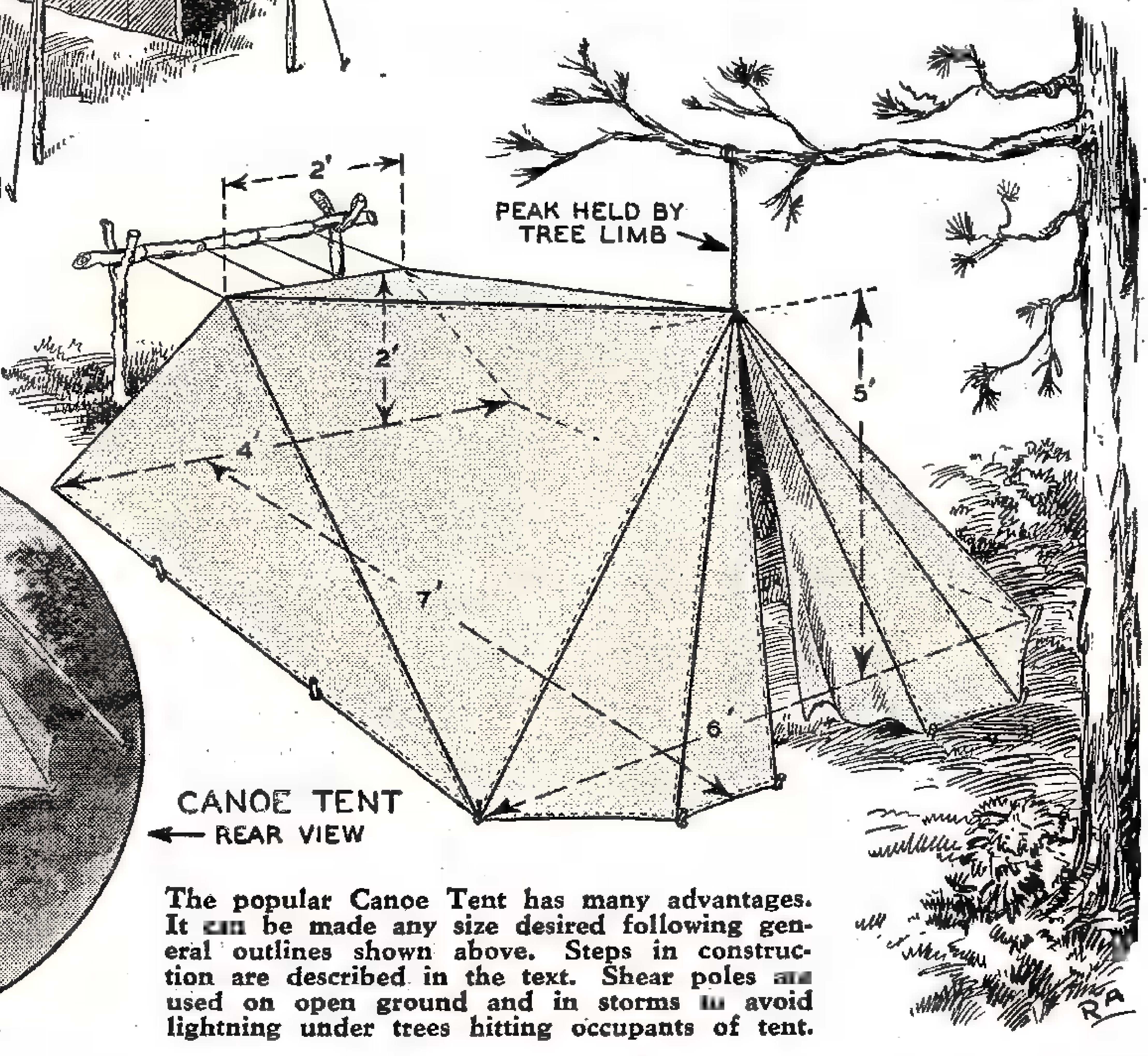
The shelter tent cuts down space to a minimum, and, on the average, is a sleeping tent, no more no less.

Among the shelter tent patterns the so-called army or pup tent is the most common and, on the whole, the least attractive. It is merely a modification of what is known as the wedge or A-tent with a rear extension added to make it a trifle more roomy than it otherwise would be.



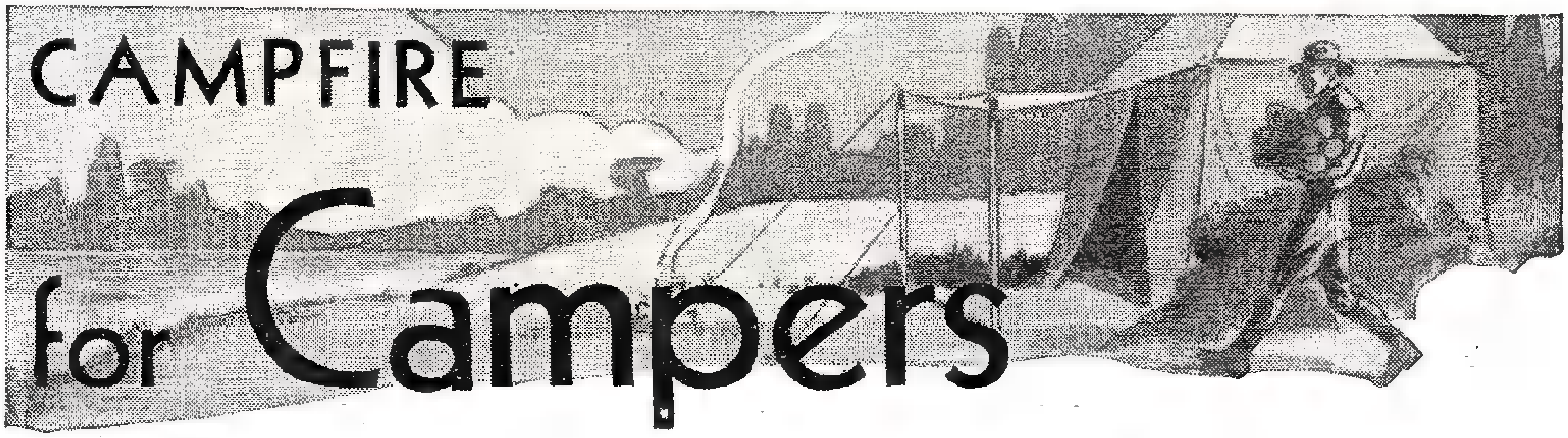
The Dan Beard pattern, above, in many ways is the ideal light tent. Fires can be built in front of it to throw heat into the interior of the tent on cold days.

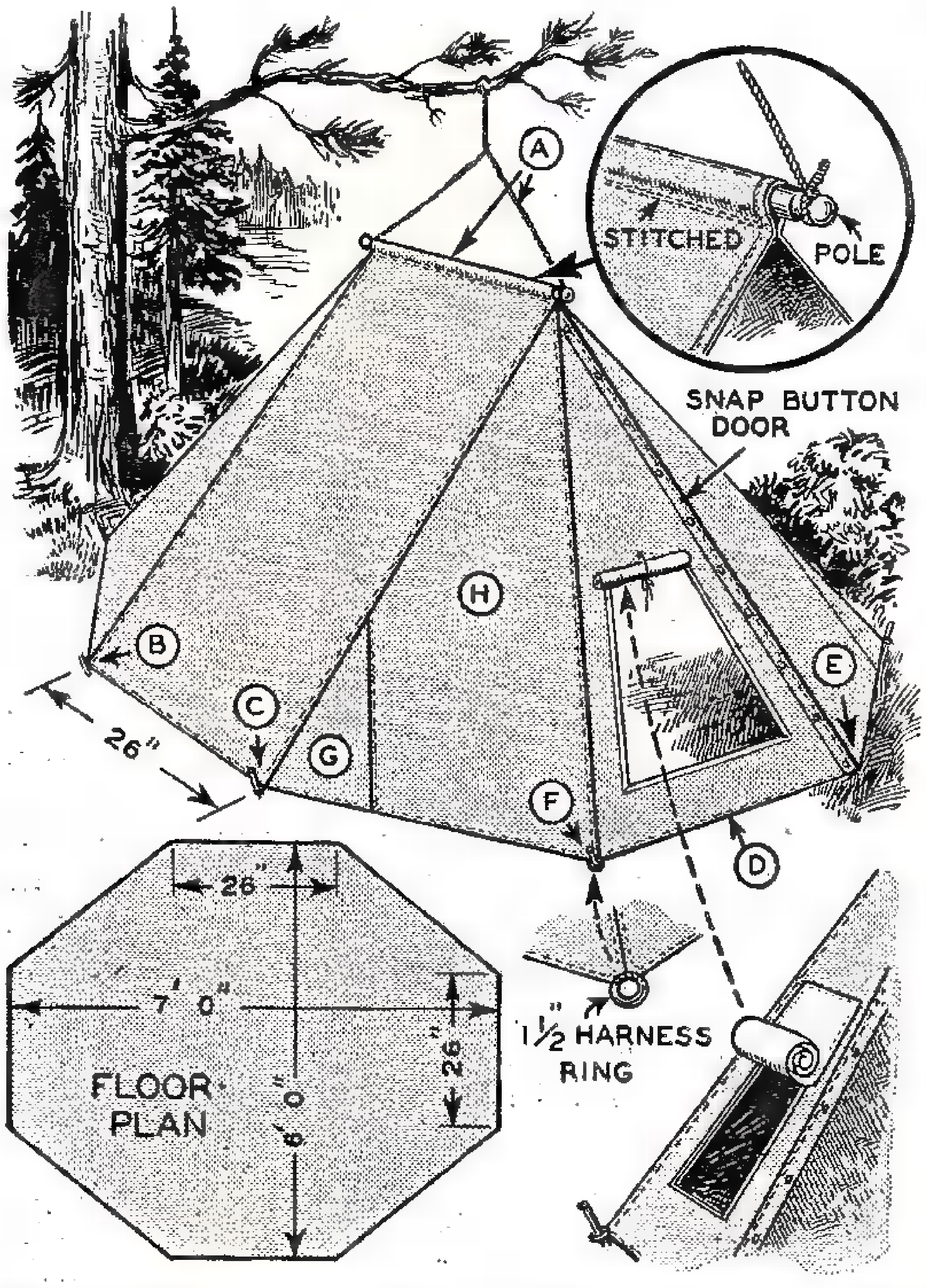

PEAK HELD BY SHEAR POLES



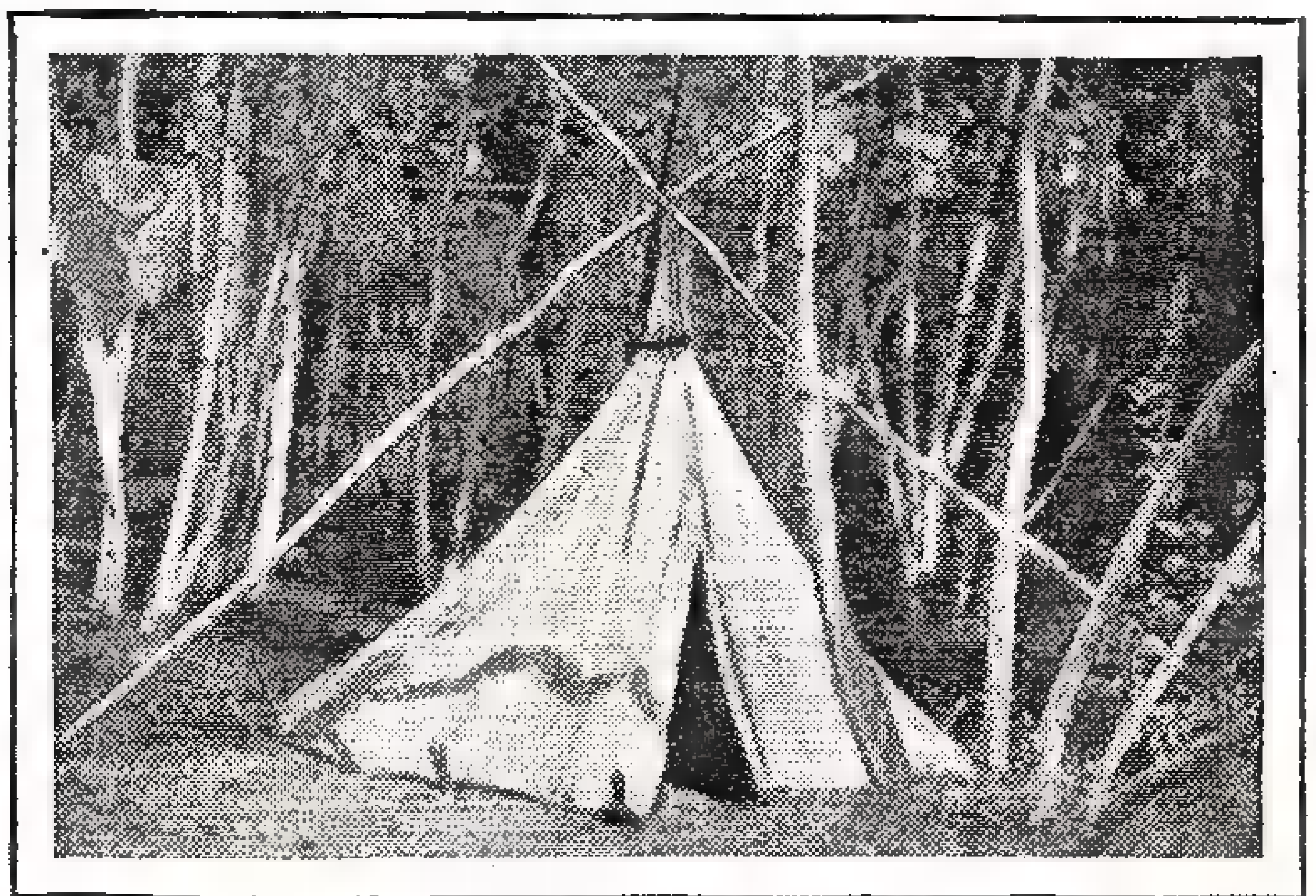
The popular Canoe Tent has many advantages. It can be made any size desired following general outlines shown above. Steps in construction are described in the text. Shear poles are used on open ground and in storms to avoid lightning under trees hitting occupants of tent.

CAMPFIRE for Campers

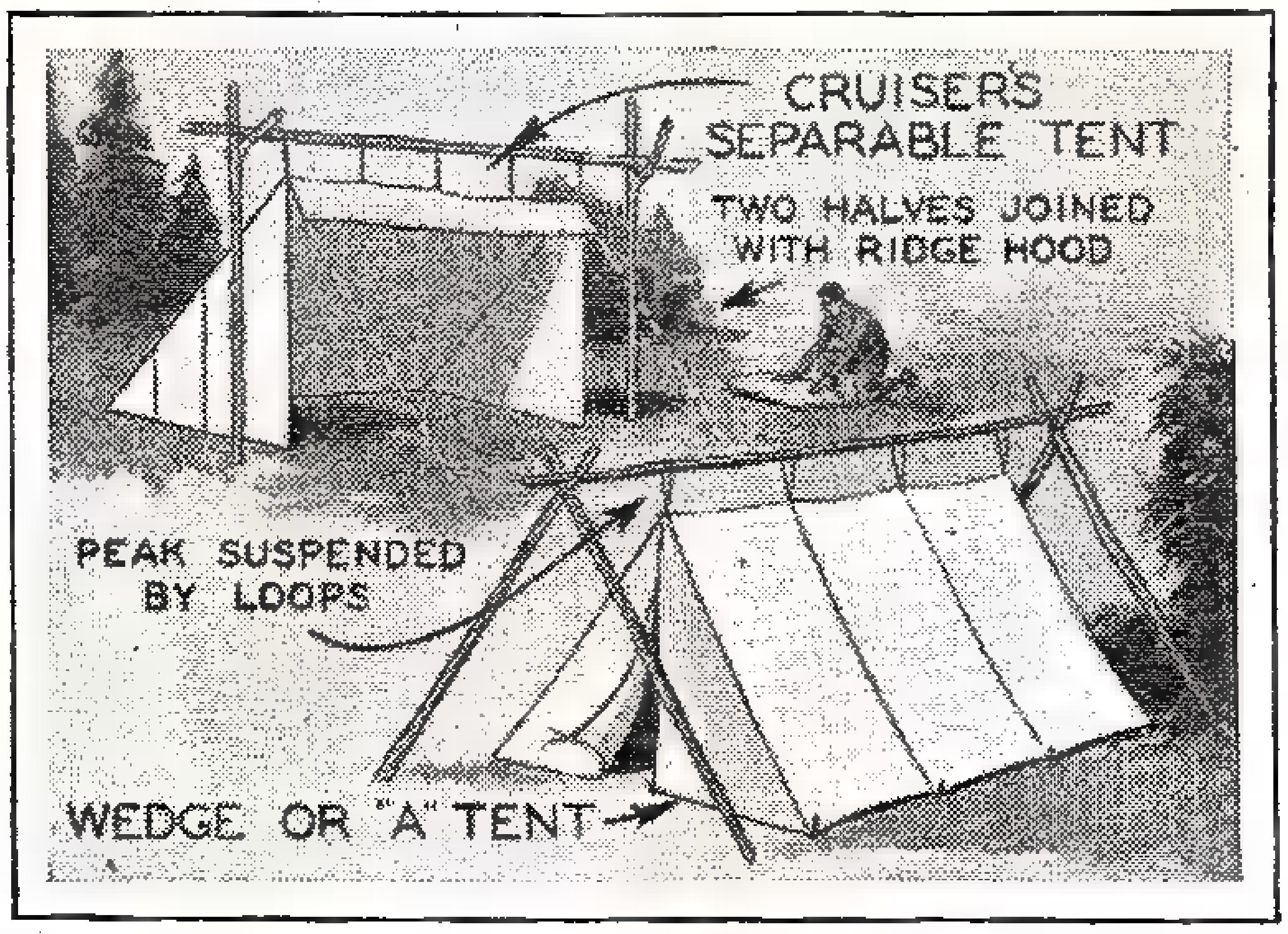




This tent, designed by Robert Page Lincoln, is roomy and rain proof and can be made easily. Openings in the flap and rear provide ventilation on sultry summer evenings.



The Lincoln model tent in actual use. Note that the peak is held up by shear poles. The tent is five feet high. All light tents can be simply lined out with cords.



The Cruiser's Separable and Wedge Tents are among the simplest of light tent designs described in the text.

The pup-tent can be made more roomy by simply adding a one foot high wall canvas all around its sides and back, thus raising it up off of the ground. This will provide considerable more space within. This wall canvas need be only waterproofed muslin or lightest canvas. If this wall canvas is added the tent will need to be erected with a ridge pole and guyed out at the sides.

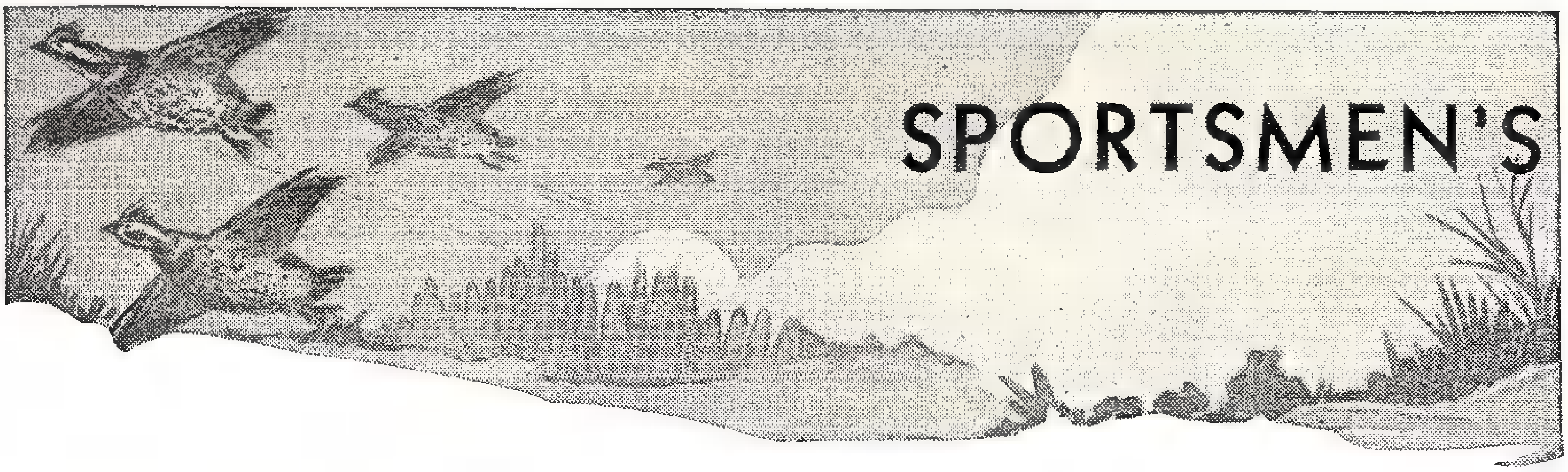
The Cruiser's separable tent, as shown in the illustration, is an example of a very simple and practical shelter tent that anyone can make. It comes in two sections, each section making a half-tent with an open front. A sort of hood of canvas caps the two sections when they are joined at the peak, the same turning any rain that falls. This is sewed to one side of the peak of one section, laps over and is tied with cords to other cords attached to the second section.

To reinforce the ridge or peak a rope of about the size and variety of a window sash cord is sewed in, to which the ridge rings or canvas loops that connect to the ridge pole are sewed. The second half of this type of tent has its peak canvas buttoned to the ridge of the other half, the peak hood overlapping the buttoned section thus protecting it from the rain.

The wedge or A-tent is, of course, merely a typical ridge tent, sewed together at the peak as most tents are. It is probably the most simple tent of all to make. This tent, too, has the rope sewed into the inside of its ridge to support the same, and give bearing to the canvas loops that are slipped over the ridge pole.

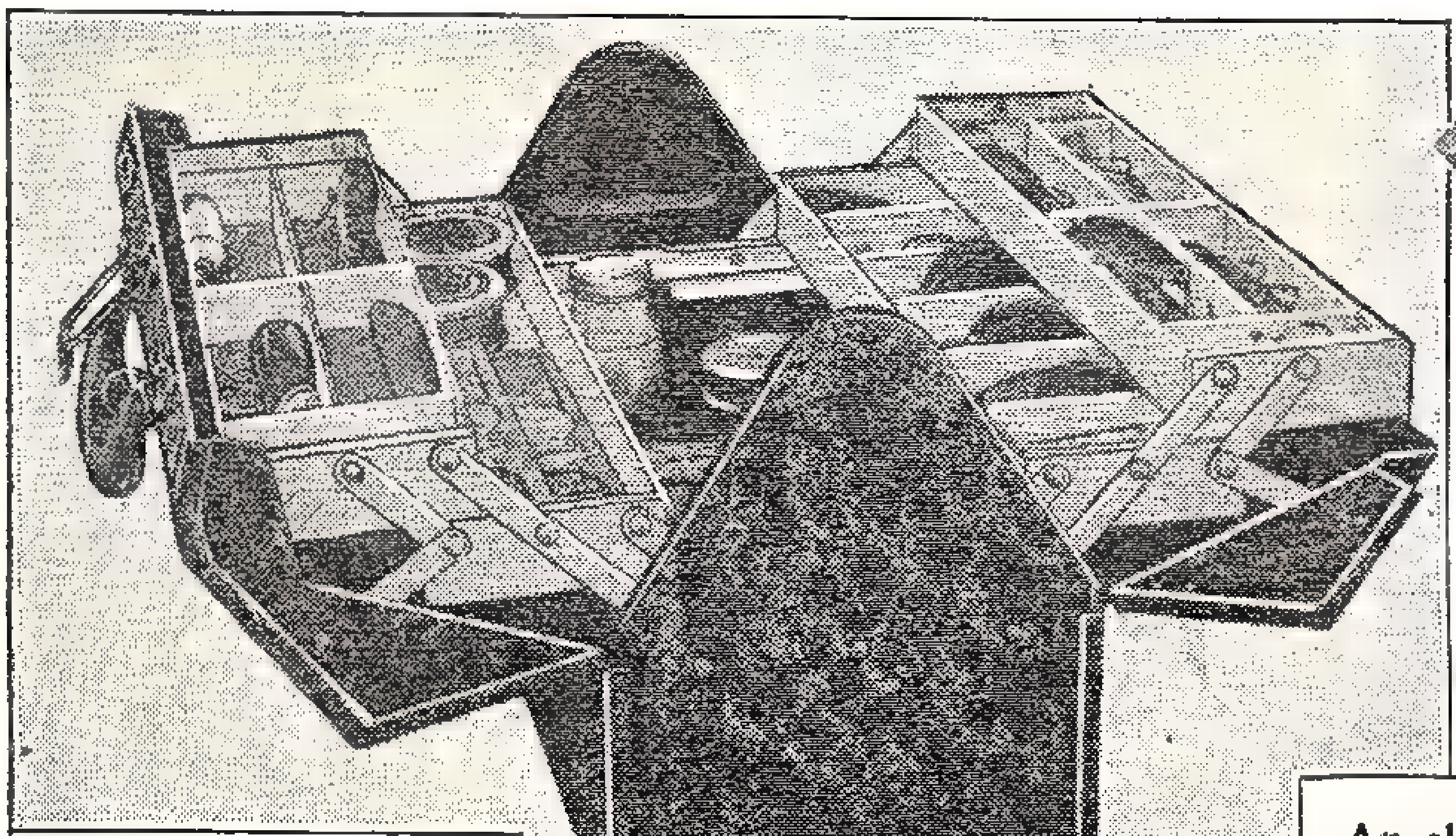
The Dan Beard pattern of tent is another

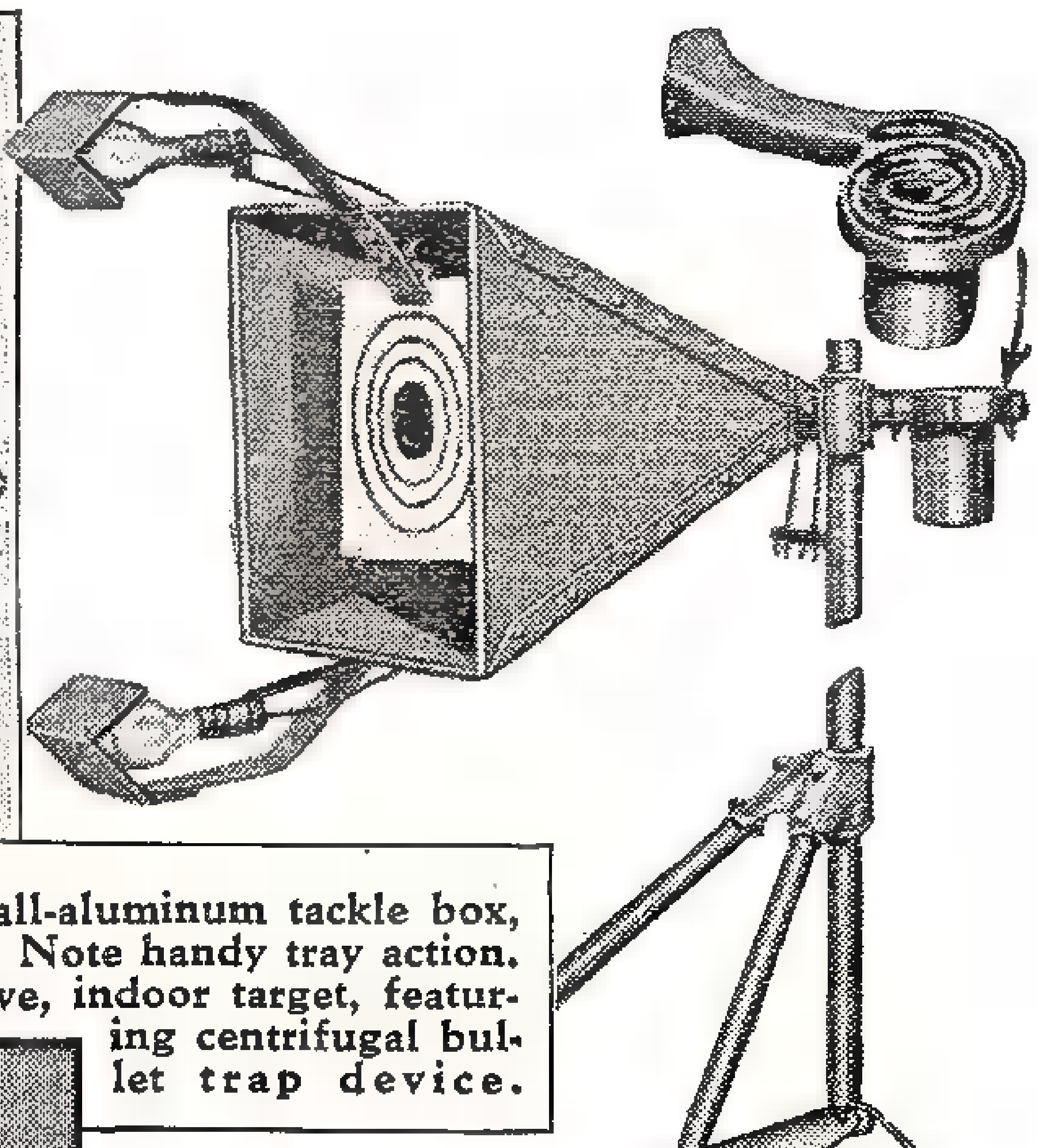
(Continued on page 130)



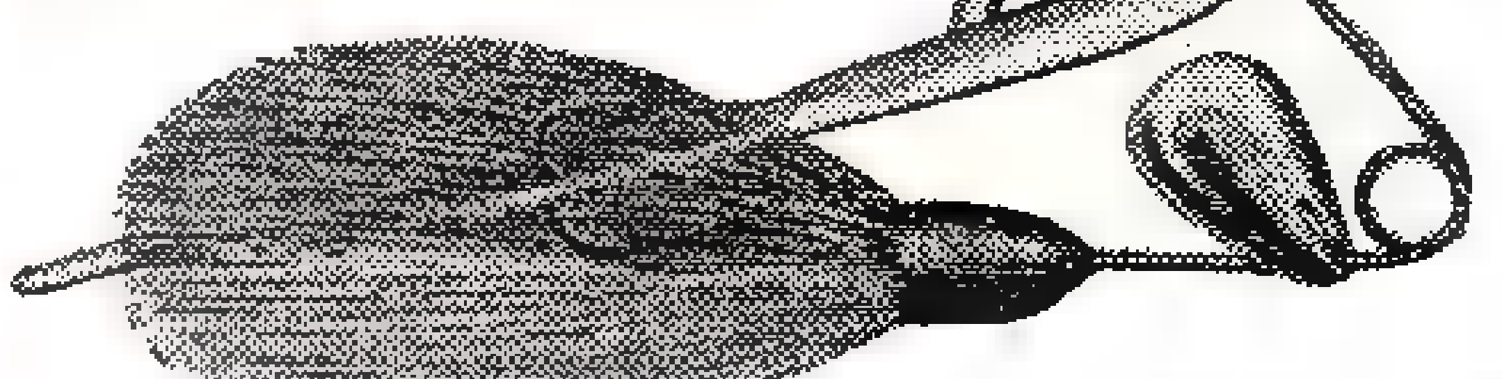
SPORTSMEN'S

Some New Accessories for Devotees of the Rod and Gun

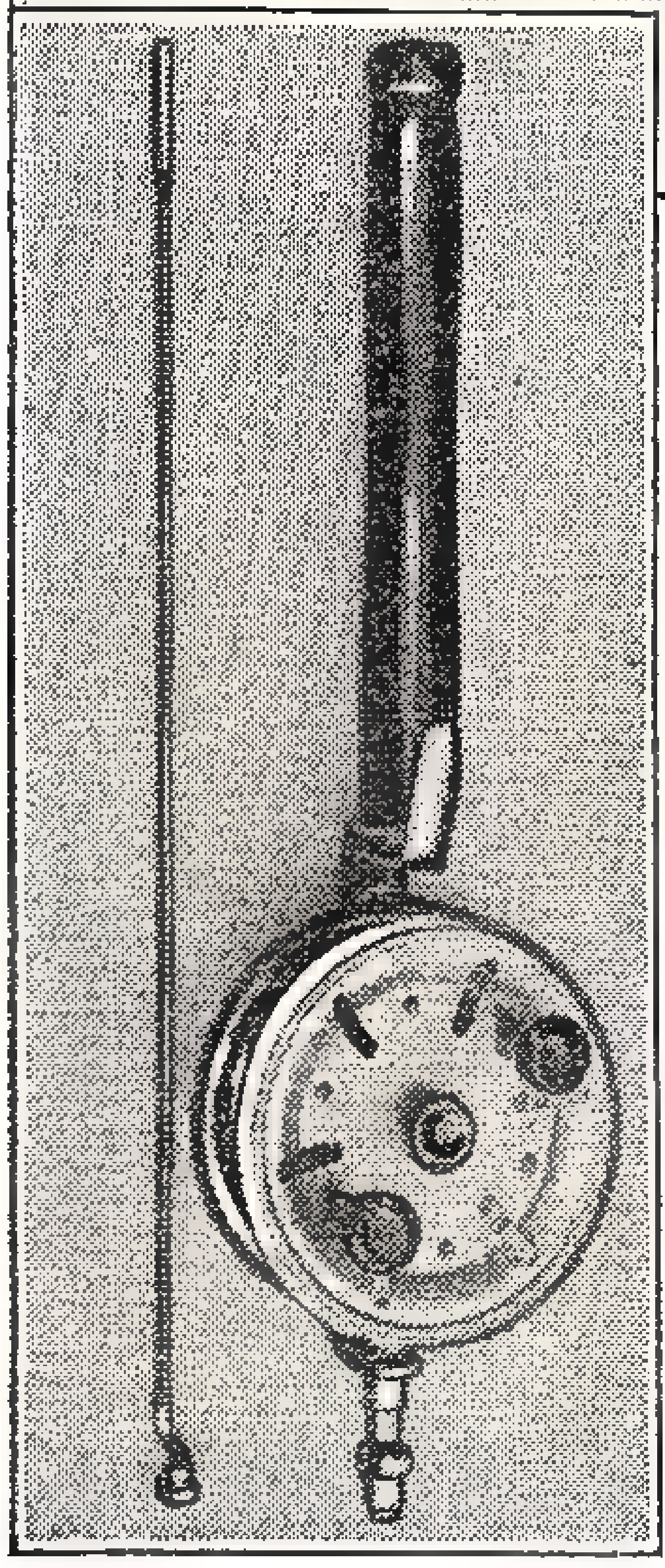




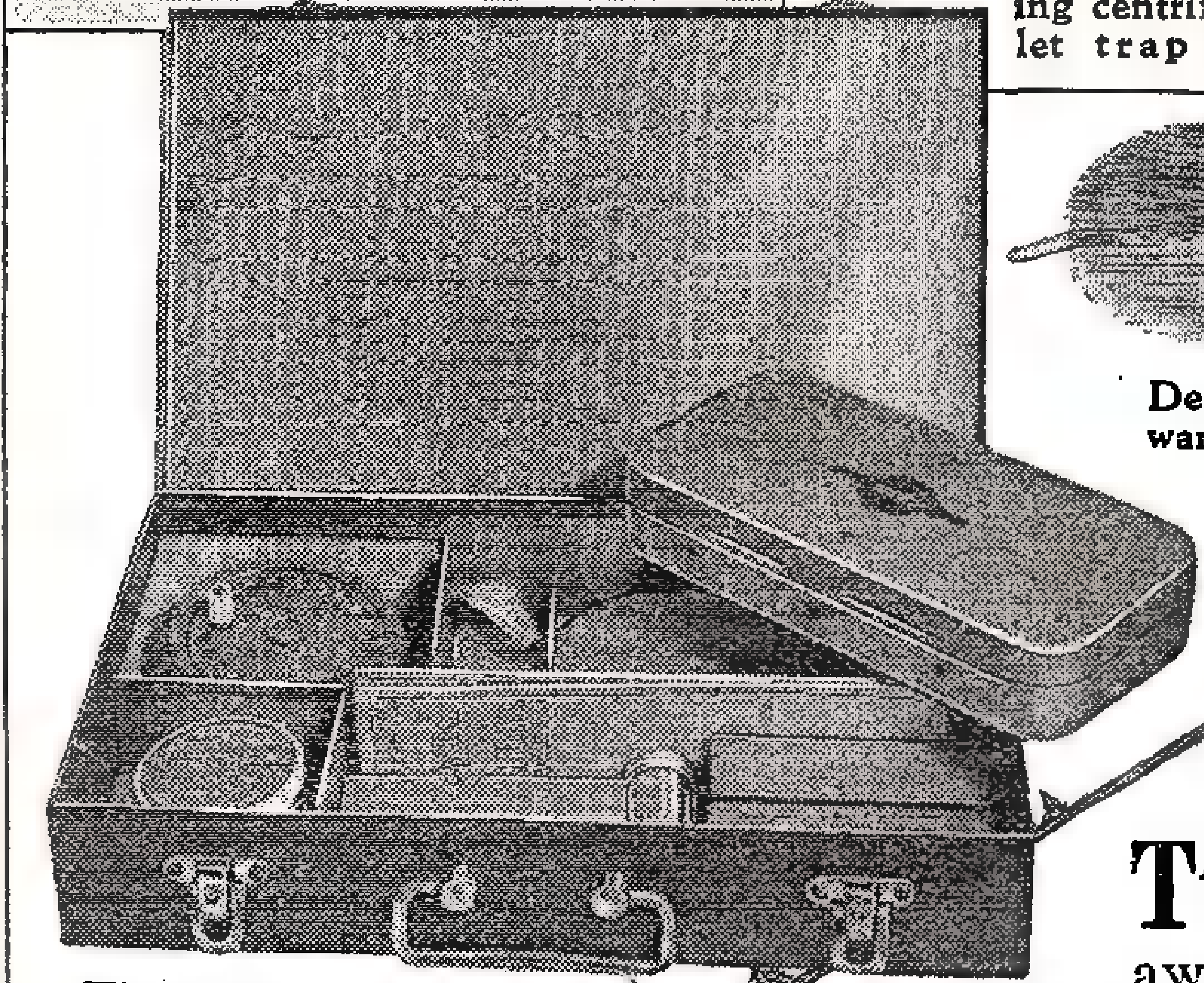
An all-aluminum tackle box, left. Note handy tray action. Above, indoor target, featuring centrifugal bullet trap device.



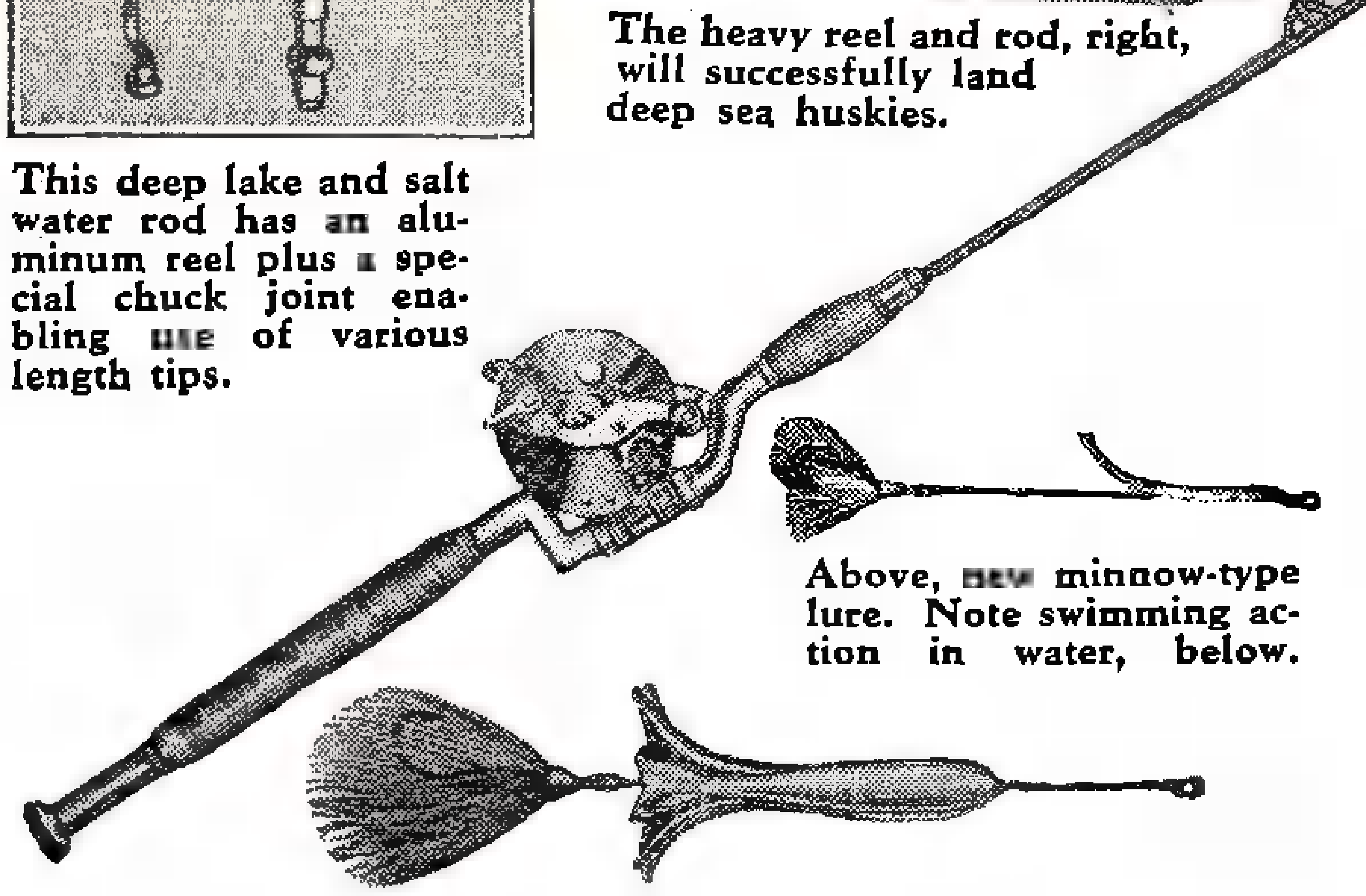
Deer hair spinner, warranted weedless.



This deep lake and salt water rod has an aluminum reel plus a special chuck joint enabling use of various length tips.



Special tackle kit, left, may be used for both fly fishing and bait casting.



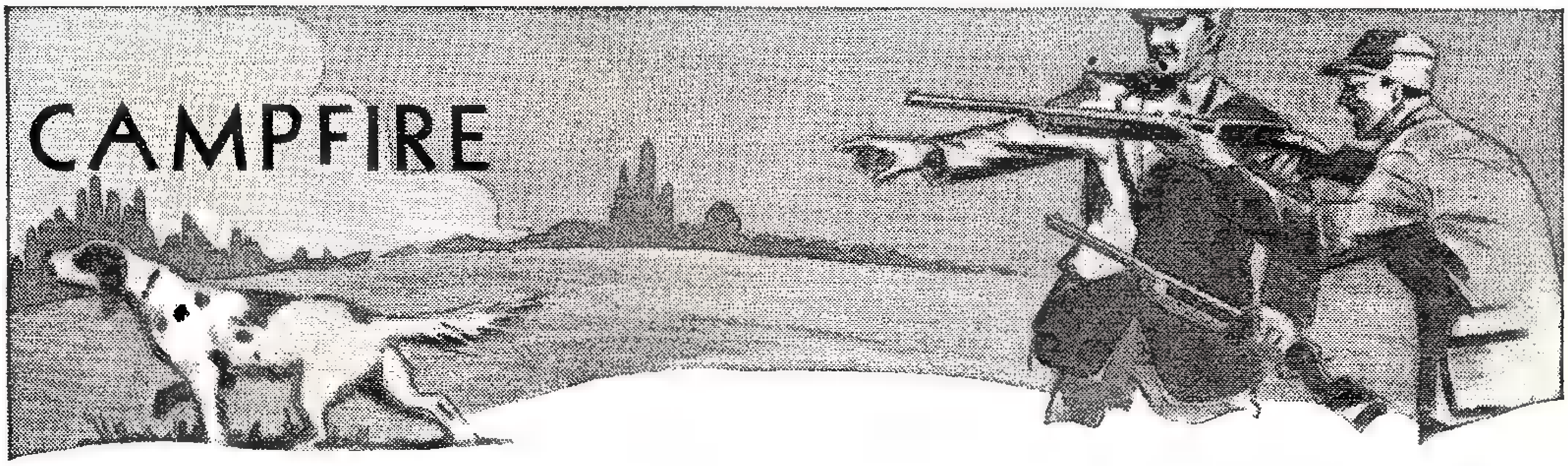
The heavy reel and rod, right, will successfully land deep sea huskies.

Above, new minnow-type lure. Note swimming action in water, below.

TAKING up the challenge of the "big ones" that got away last summer, tackle designers have concentrated upon evening the odds in the 1934 battle with the finny tribes.

The weight of deep sea rods has been lightened with sturdy aluminum reels. Tackle boxes have likewise been made lighter and more compact. Weedless, life-like lures have been designed to inveigle the wiliest bass from the depths of his shadowy pool.

Nor have the rifle and pistol fans been forgotten. A new indoor target embodies a centrifugal bullet trap which will stop anything from the .22 pellets to the heavy .45 pistol slugs.



Train Your Hunting Dog for Field Work on Game Now

PATIENCE, kindness, and time are the main essentials in training dogs for hunting game. Most handlers start training pointers, setters, spaniels and retrievers at six months. By the time the puppy is ten months old he is usually ready for the field.

You can not break a dog of gunshyness by firing a gun over his head or directly at him. The easiest way is to take a gun of small caliber and have someone fire it at some distance from the dog while you pat the animal's head to quiet him. Gradually decrease the distance until the dog shows no sign of fright. Then follow the same procedure with a regular hunting gun. Finally let the dog loose.

Retrieving, natural to all hunting dogs, is best begun in the yard with a check cord. The dog must learn to stop on command; drop down where he is on command; and "fetch" when told to do so.

Hold a long cord passing through a ring on a stake in the ground and attached to a choke collar. Hold the dog near the stake, get some distance away and then attract his attention. After he moves a few paces toward you, call "stop" and check him with the cord.

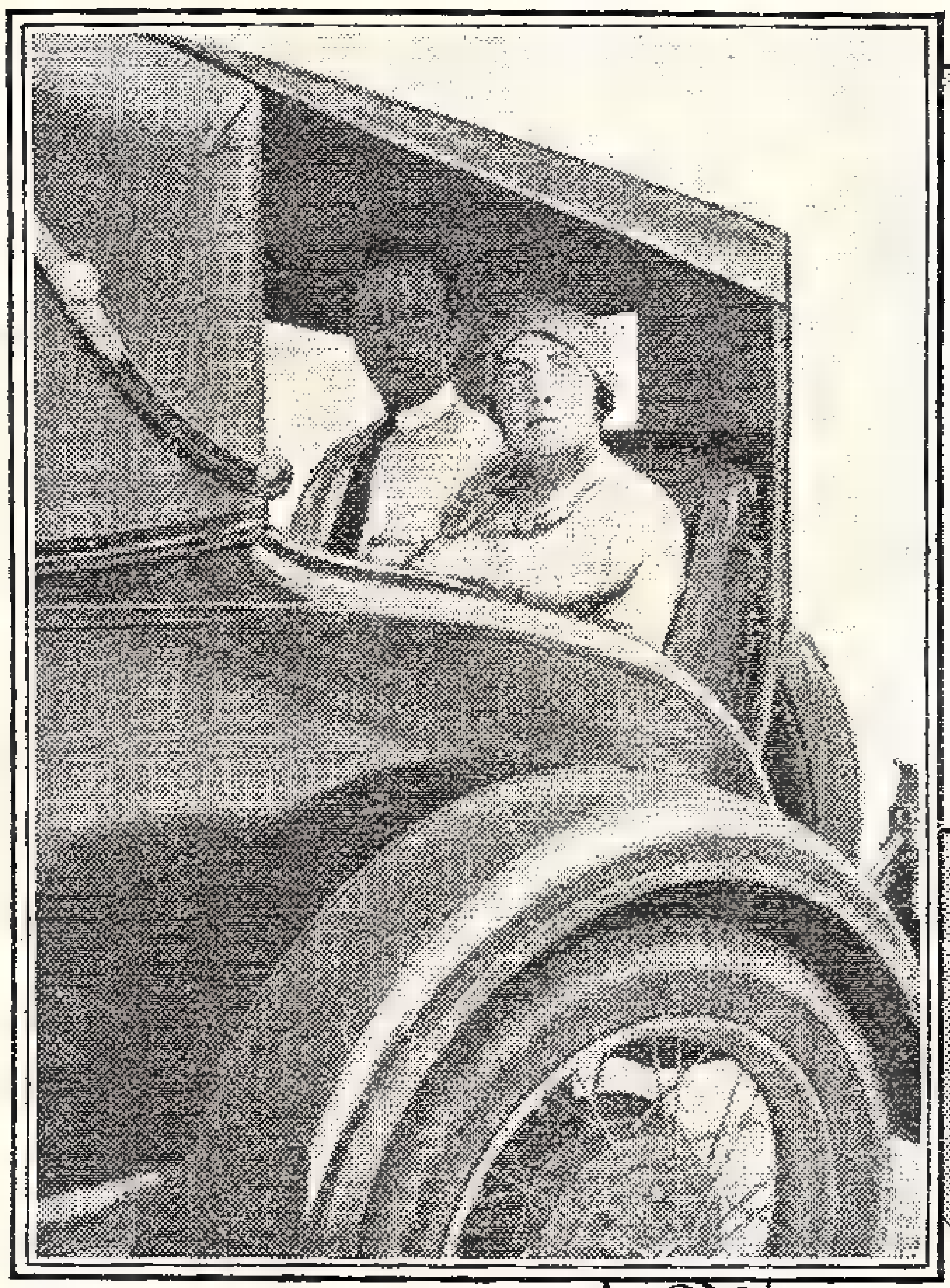
After a few days walk toward him, checking him if he moves. Then walk past him and eventually you will be able to check him without the cord.

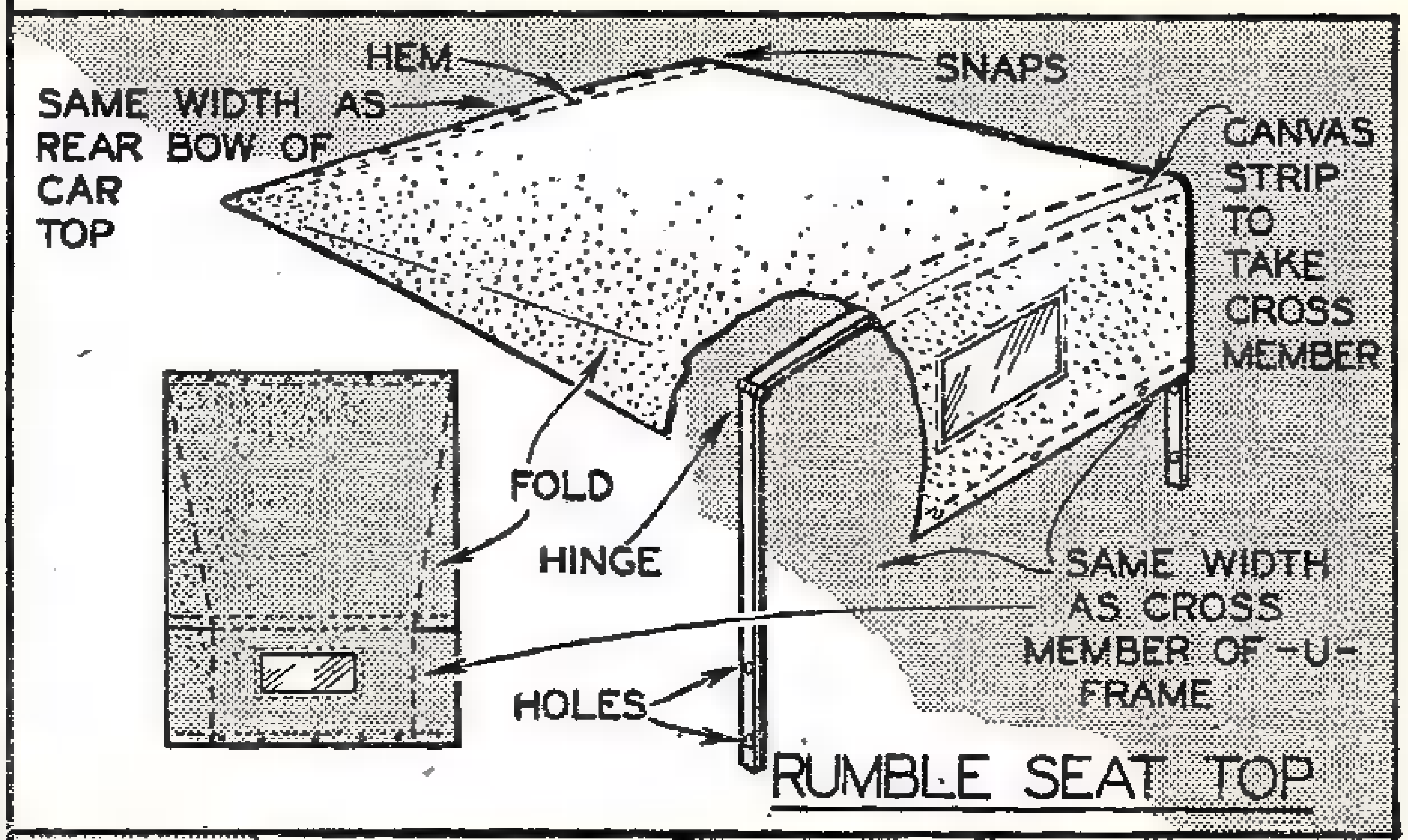
A dog will easily pick up field work if permitted to work with an older trained dog. Preliminary retrieving can be taught in the yard. Get him to open his mouth and say "fetch" as you push an object into it. Be sure that he does not drop the object until you say "give."

All hunting dogs love the chase. Here is a champion orange and white pointer hurdling a fence at field trials. Training dogs for the field usually starts at 6 months.

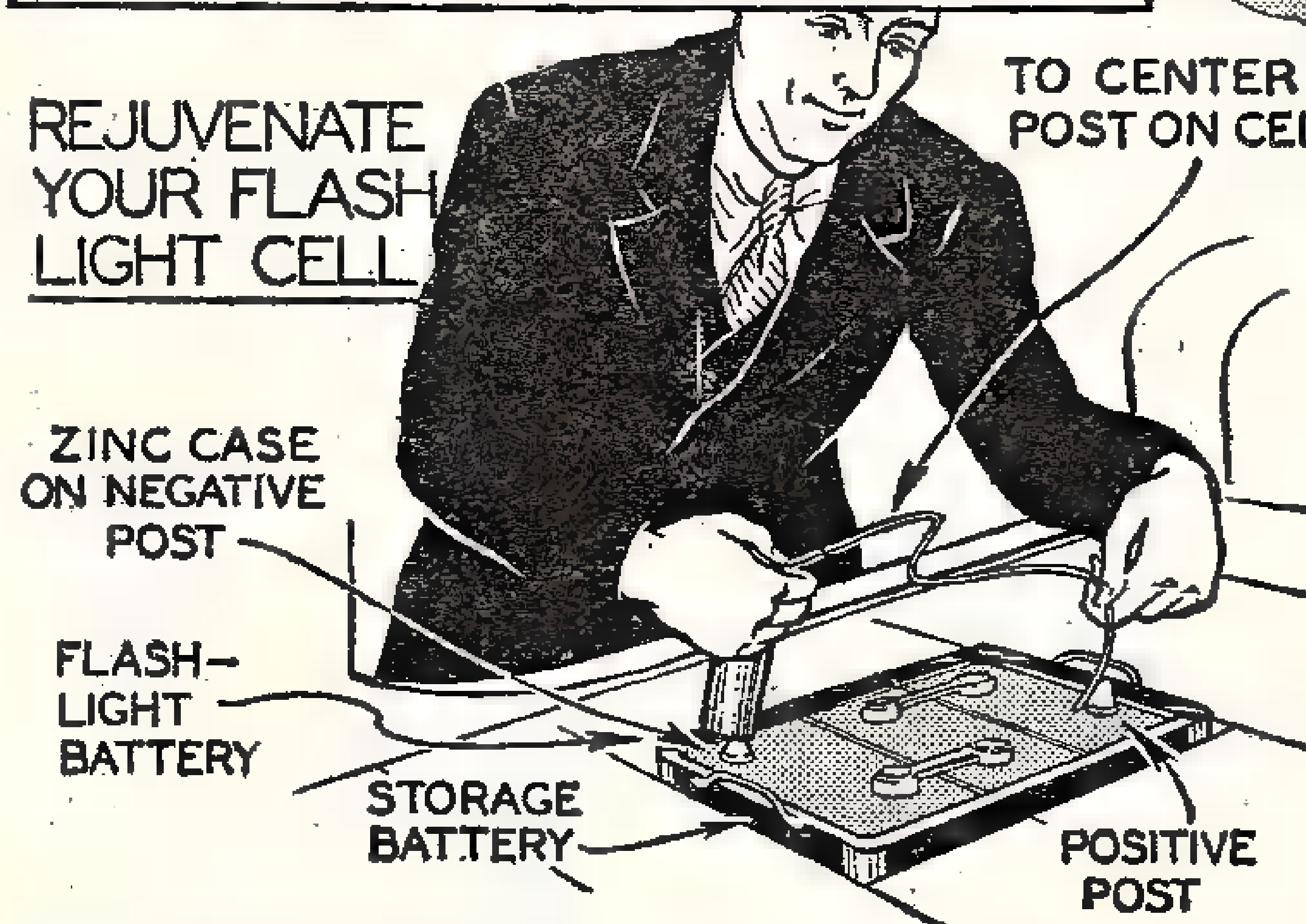
Puppies learn best when accompanied by an older dog. Here 2 puppies are watching their mother bring in a pigeon.

Handy Ideas for AUTO Owners

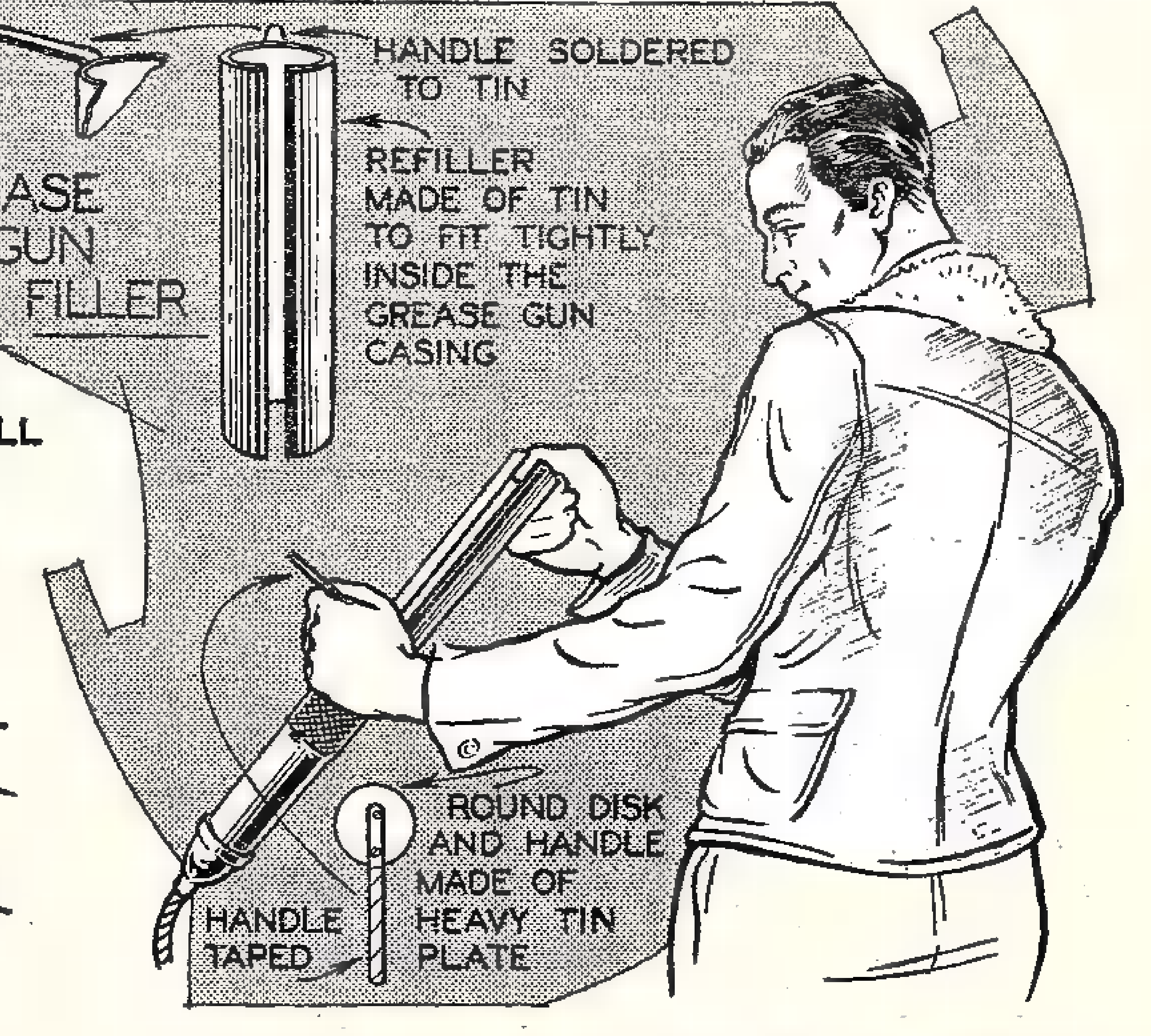



HEM
SNAPS
SAME WIDTH AS REAR BOW OF CAR TOP
CANVAS STRIP TO TAKE CROSS MEMBER
FOLD
HINGE
SAME WIDTH AS CROSS MEMBER OF -U- FRAME
HOLES
RUMBLE SEAT TOP

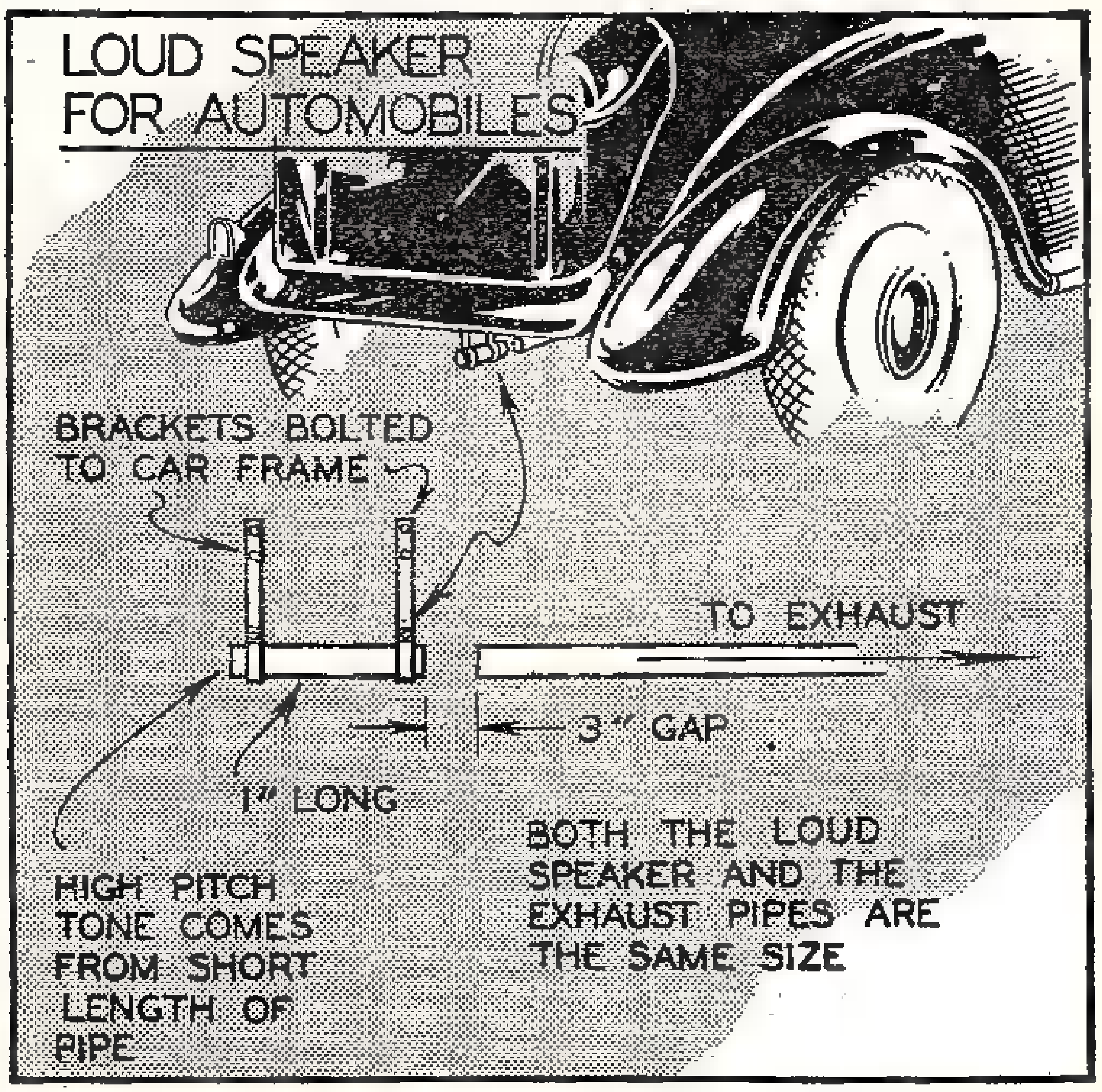
Canvas on frame makes removable rumble seat top.


REJUVENATE YOUR FLASH LIGHT CELL
TO CENTER POST ON CELL
ZINC CASE ON NEGATIVE POST
FLASH-LIGHT BATTERY
STORAGE BATTERY
POSITIVE POST

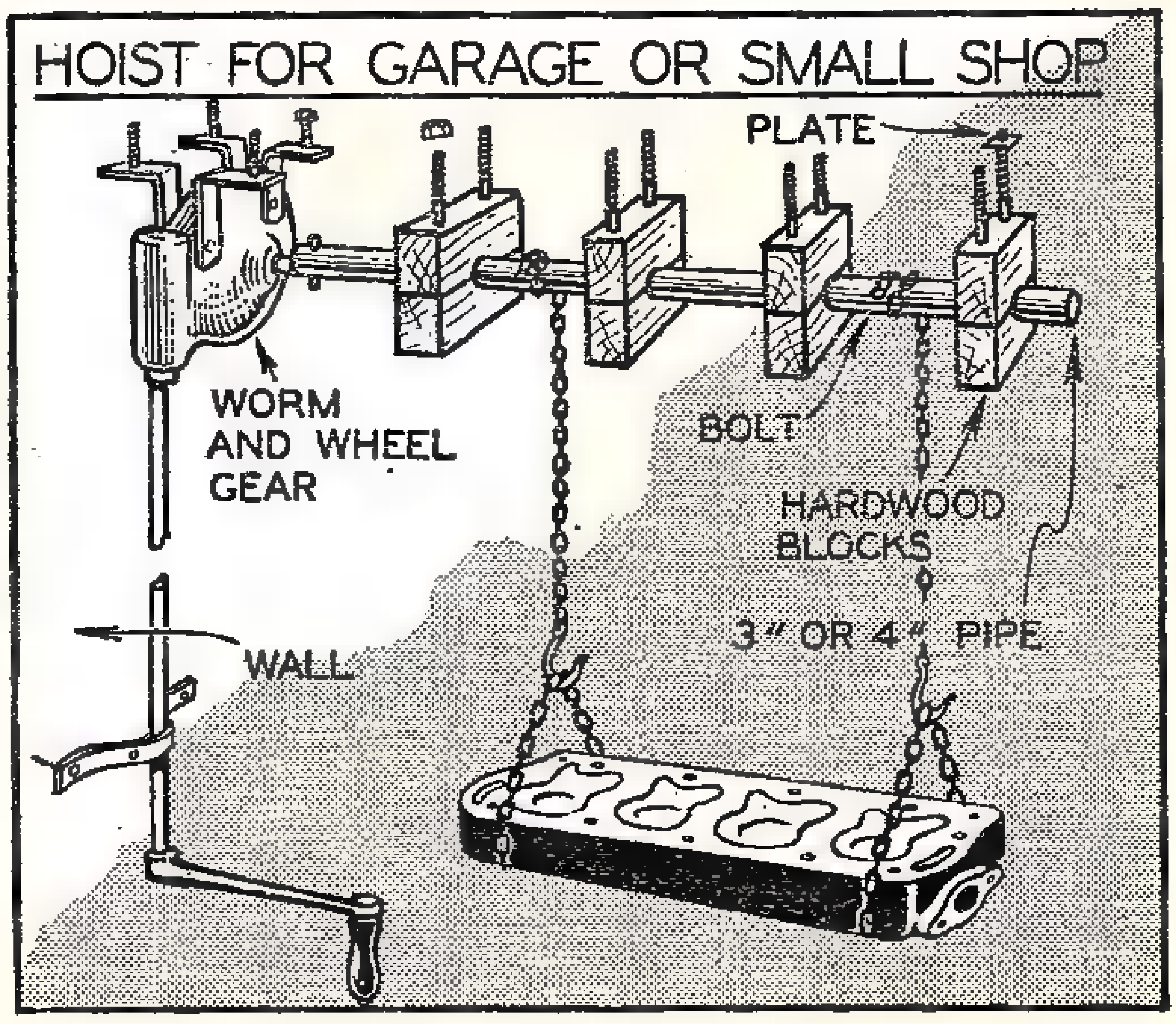
Dead dry cells can be pepped up with storage battery by holding as shown for 1 minute.


GREASE GUN FILLER
HANDLE SOLDERED TO TIN
REFILLER MADE OF TIN TO FIT TIGHTLY INSIDE THE GREASE GUN CASING
ROUND DISK AND HANDLE MADE OF HEAVY TIN PLATE
HANDLE TAPED

Pack grease in tube with wood paddle, slip refiller into barrel of grease gun, and push grease down into gun with round disk. Handle of disk is narrow to fit refiller slot.


LOUD SPEAKER FOR AUTOMOBILES
BRACKETS BOLTED TO CAR FRAME
TO EXHAUST
3" GAP
1" LONG
HIGH PITCH TONE COMES FROM SHORT LENGTH OF PIPE
BOTH THE LOUD SPEAKER AND THE EXHAUST PIPES ARE THE SAME SIZE

To get a deep, powerful note from your auto, mount one foot length of pipe in back of exhaust, leaving 3" gap. Air is sucked into loud speaker through gap by exhaust gases.

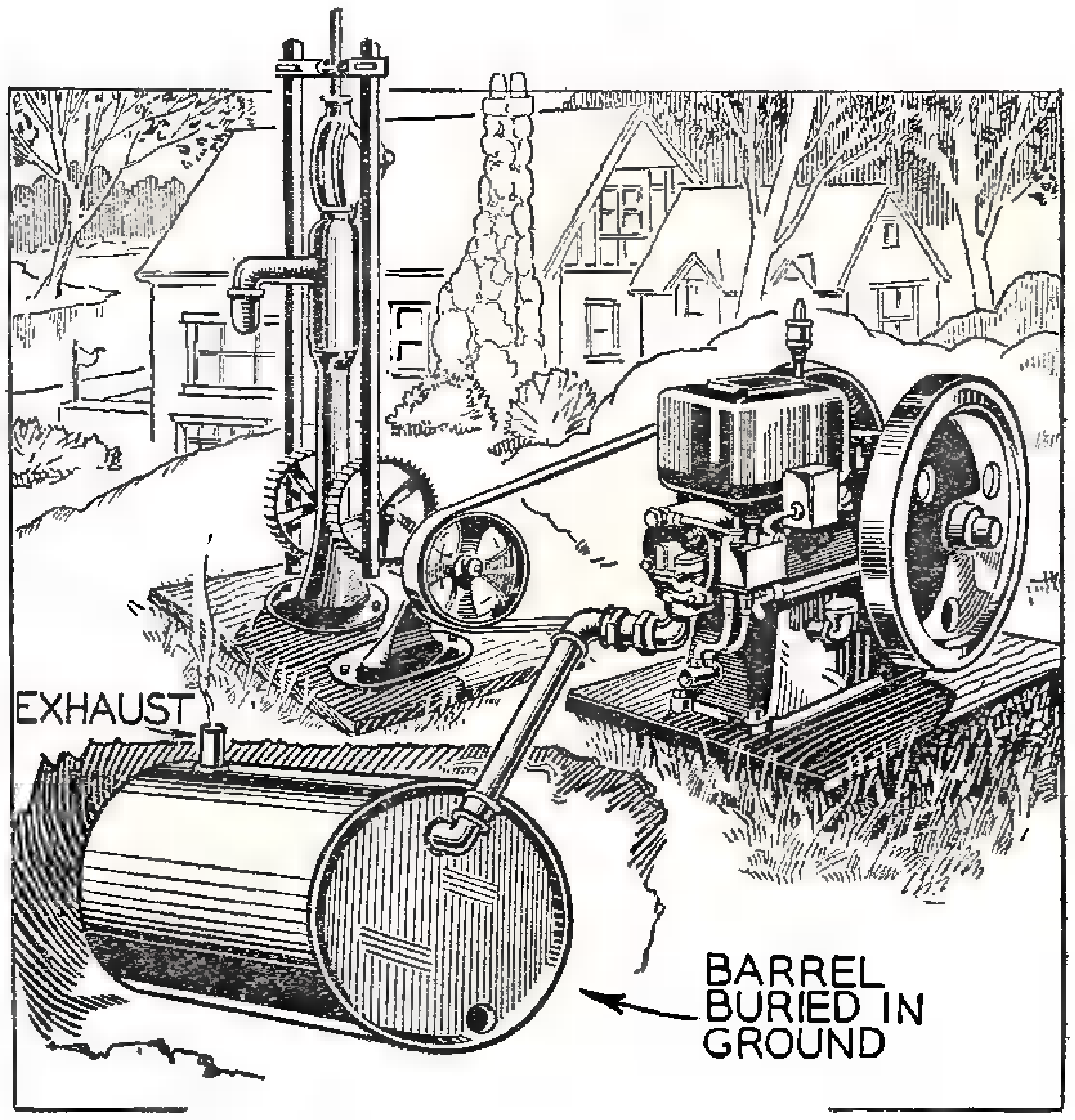

HOIST FOR GARAGE OR SMALL SHOP
PLATE
WORM AND WHEEL GEAR
BOLT
HARDWOOD BLOCKS
3" OR 4" PIPE
WALL

Mount worm type steering gear housing on roof of shop. Attach crank arm to worm shaft, and 3" pipe to large gear shaft. Fasten lifting chains to heavy eye bolts in pipe. Hoist will easily lift even heaviest engines out of cars.

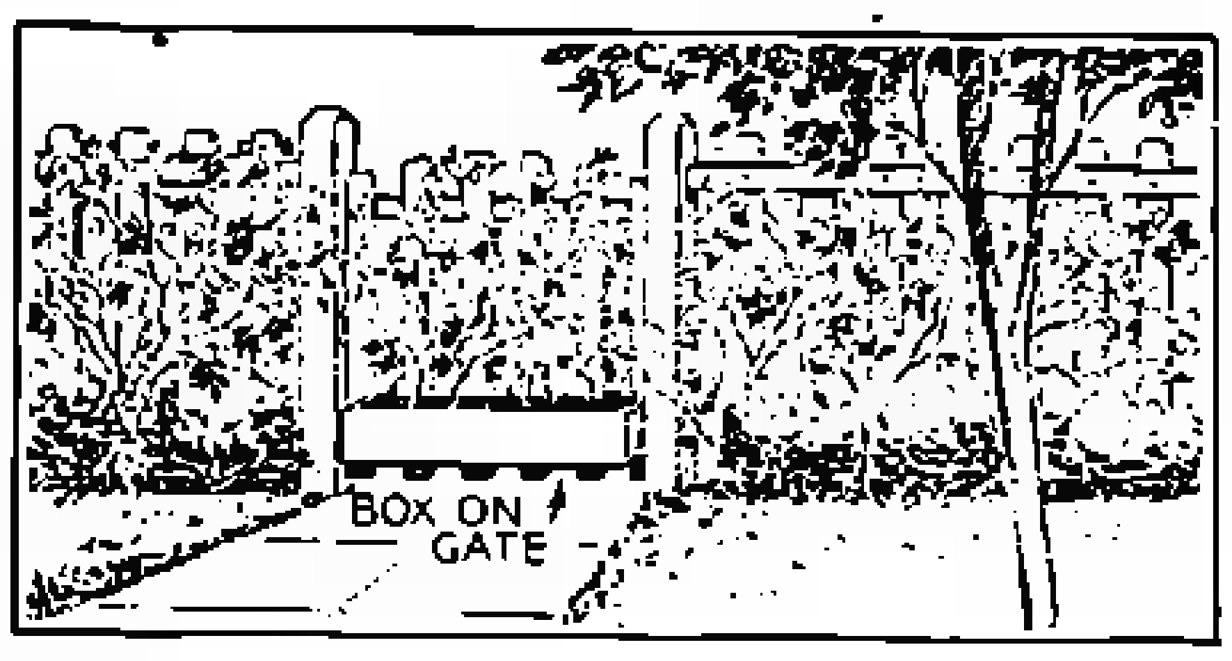
Save Money With These Home and Garden Handikinks

Barrel Makes Engine Muffler

THE noise of the small gas engines used in many places for pumping water is often disturbing. Bury an empty barrel in the ground near the engine and run the exhaust pipe into it. Make a moisture drain hole at bottom of tank, and gas escape outlet pipe at top.—S. H. Bailor.

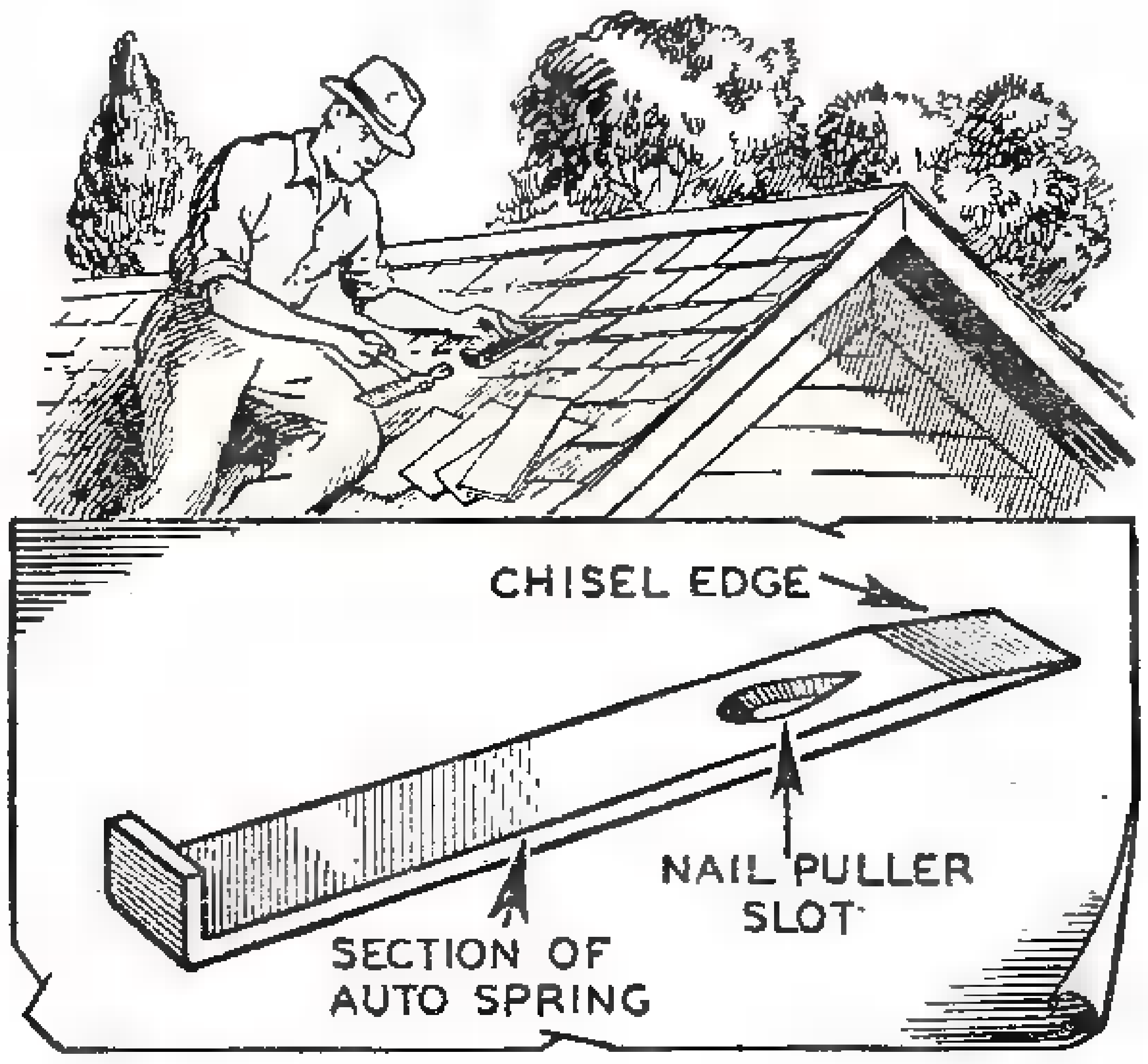

EXHAUST
BARREL BURIED IN GROUND

Flower Box Hides Garden Gate



VINES and flowers are planted along the backyard fences of many homes to hide the yard, but there is always an open spot at the gate. Mount a box near the bottom of the gate, fill with good dirt, and plant vines or flowers.—M. Lonn.

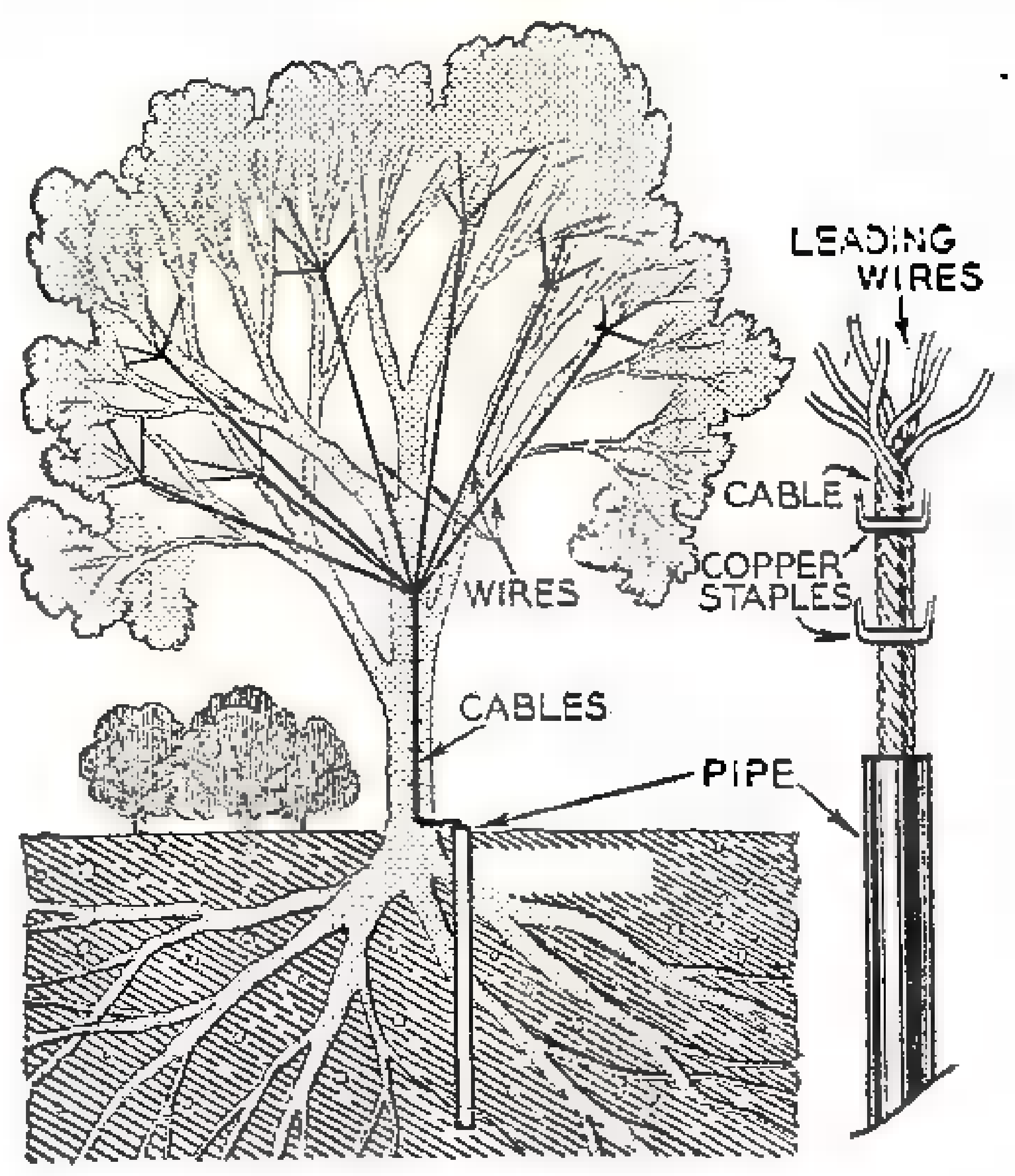
Handy Tool for Repairing Shingle Roofs


CHISEL EDGE
NAIL PULLER SLOT
SECTION OF AUTO SPRING

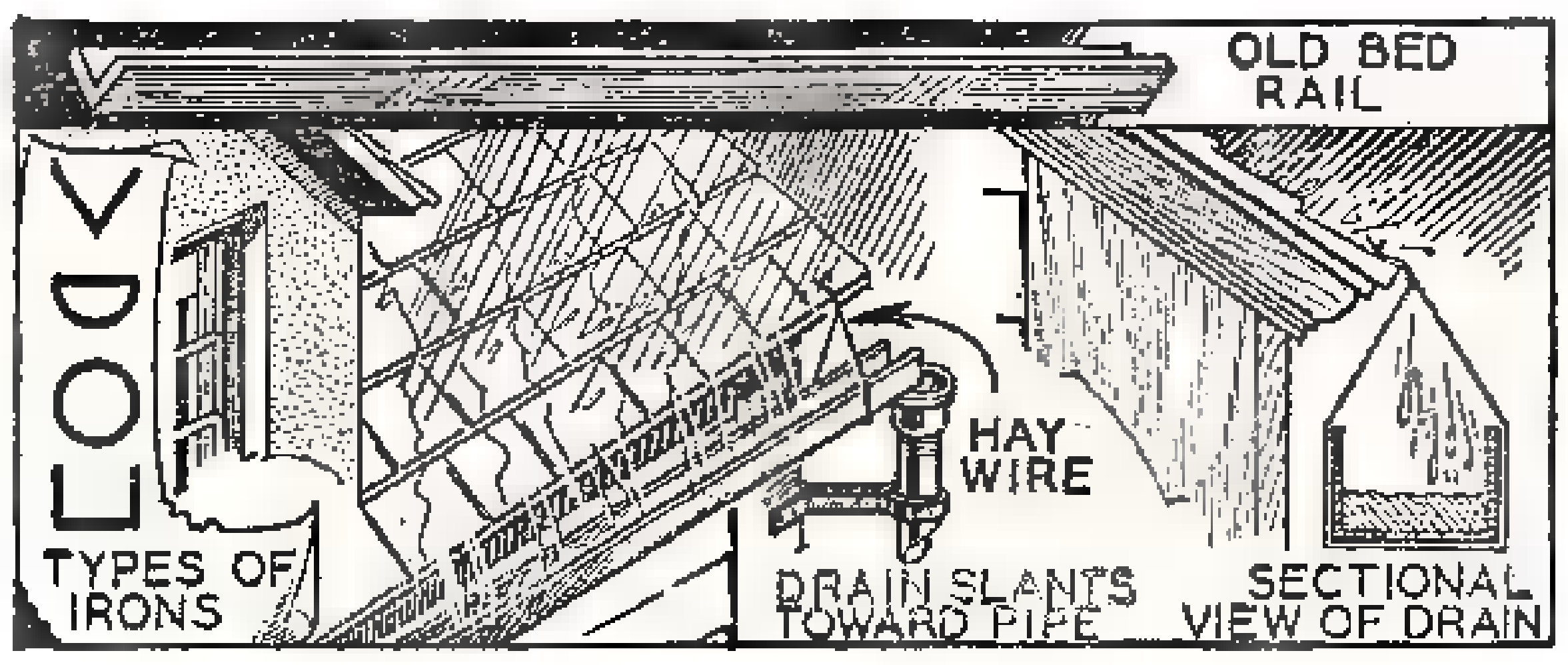
THIS handy tool is made by cutting off, heating, and bending a section of an auto spring leaf. One end is ground to a chisel edge, and used for cutting off nails underneath shingles. Use chisel and drill to cut nail-pulling slot. Strike the turned up edge to pull nails. — L. Schneider.

Lightning Rod Protects Trees

TO PROTECT valuable trees from lightning, drive a 10′ iron pipe into ground close to tree. Nail ⅛″ stranded copper cable along tree trunk, and run branch cables to high branches as shown in drawing.—H. M. Anderson.


LEADING WIRES
CABLE
COPPER STAPLES
WIRES
CABLES
PIPE

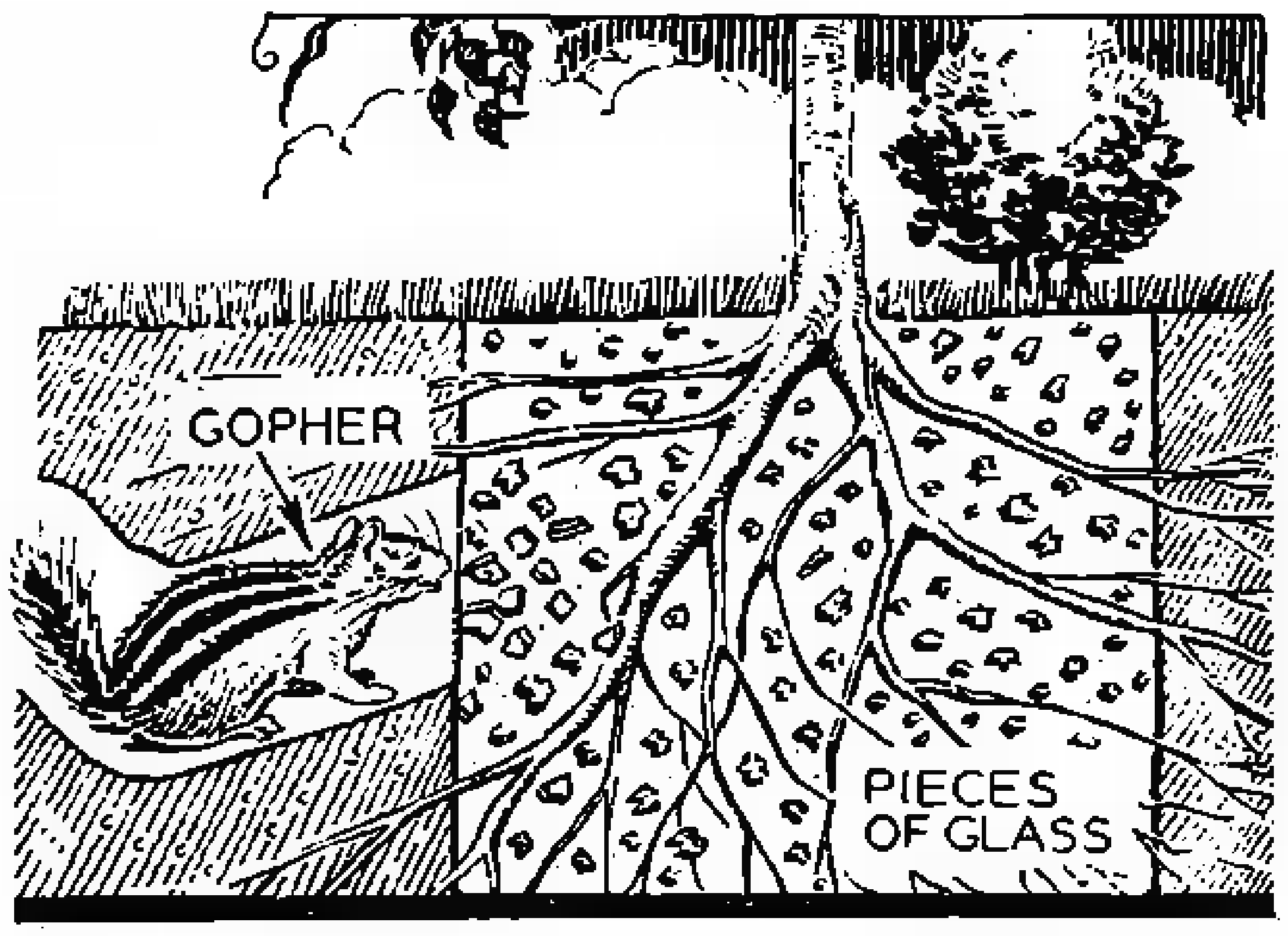
Eaves Troughs


OLD BED RAIL
TYPES OF IRONS
HAY WIRE
DRAIN SLANTS TOWARD PIPE
SECTIONAL VIEW OF DRAIN

CHANNEL irons and metal tubing from old bed frames can be put to good use as rainspouts for the garage or shed. Support the drains from the roof with wire, keeping one end always a bit higher. Many different shapes may be used.—M. Y. Rice.

Broken Glass Keeps Gophers From Trees

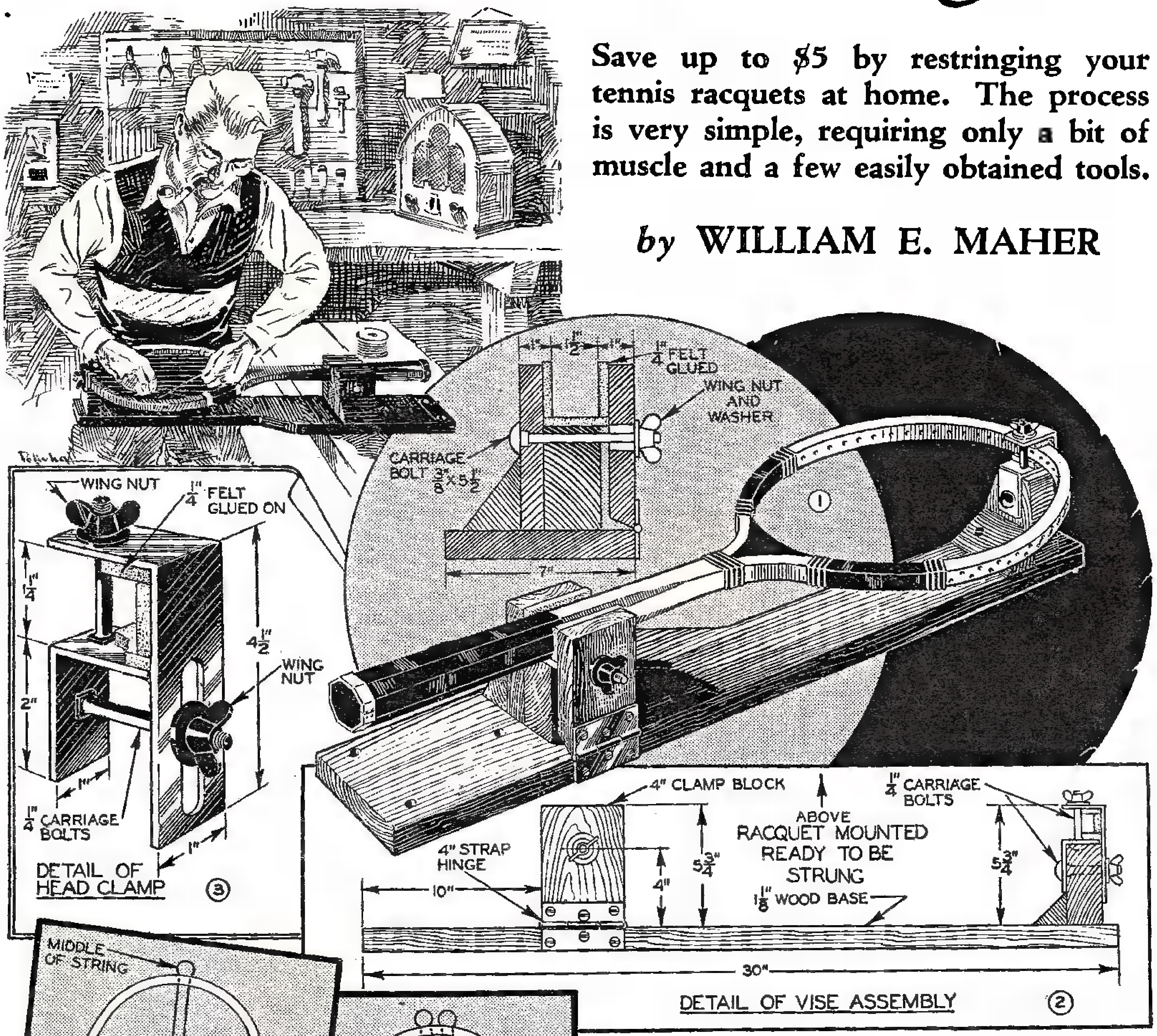
MANY prized young trees wilt away and die soon after they are planted, because gophers take a notion to burrow among the roots. An amazingly efficient method for foiling the wily gopher is simple and inexpensive. When planting the trees, merely scatter broken glass in thickly with the dirt being packed around the roots. Mr. Gopher will now detour after a short investigation. Tree roots will not be injured by the glass.—E. R. Dutcher.


GOPHER
PIECES OF GLASS

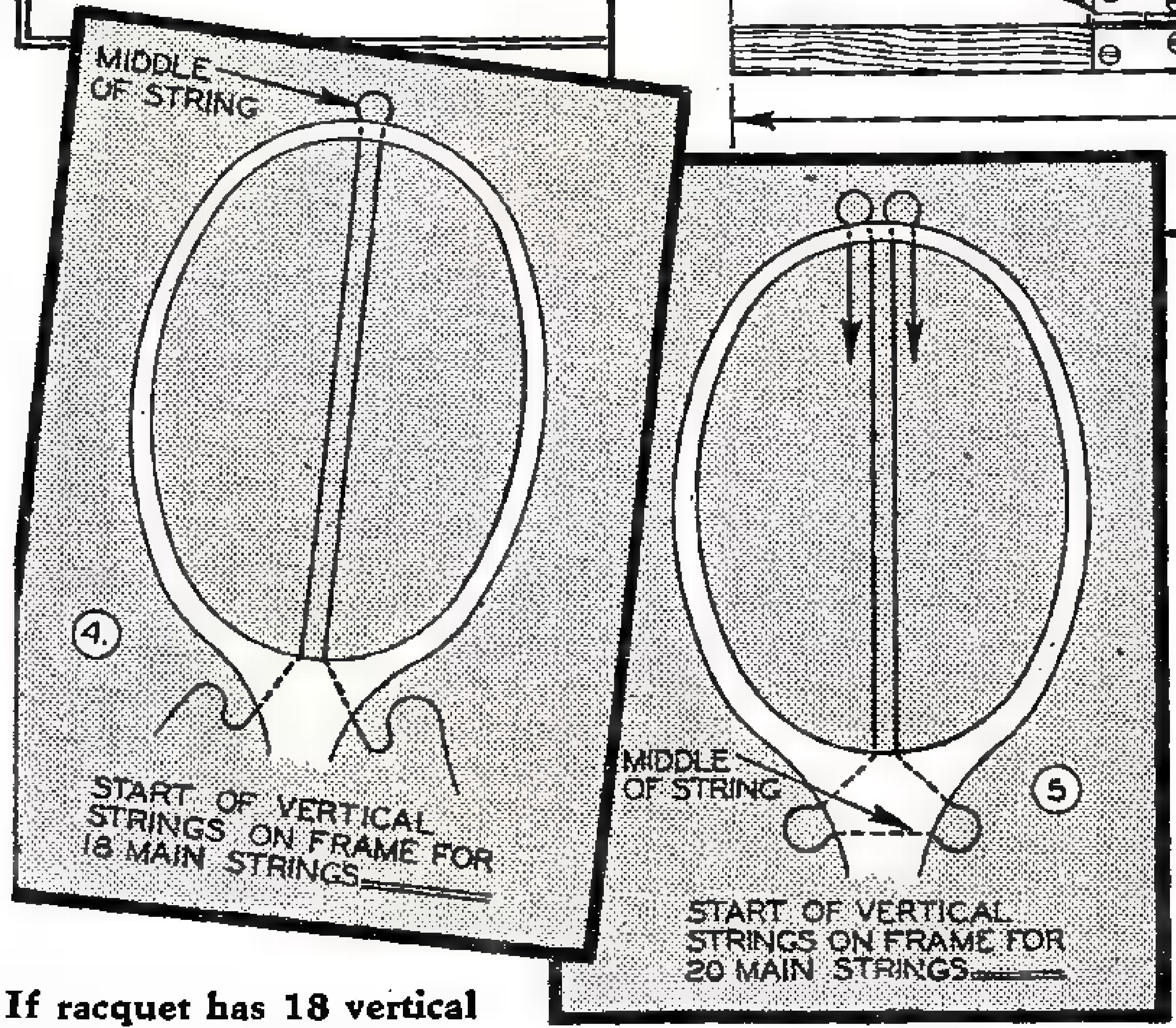
How to RESTRING Your

Save up to $5 by restringing your tennis racquets at home. The process is very simple, requiring only a bit of muscle and a few easily obtained tools.

by WILLIAM E. MAHER


1/4" FELT GLUED
WING NUT AND WASHER
CARRIAGE BOLT 3/8"x5 1/2"
1"
1/2"
7"
①
WING NUT
1/4" FELT GLUED ON
1/4"
4 1/2"
WING NUT
2"
1"
1/4" CARRIAGE BOLTS
1"
DETAIL OF HEAD CLAMP
③
4" CLAMP BLOCK
ABOVE RACQUET MOUNTED READY TO BE STRUNG
1/4" CARRIAGE BOLTS
4" STRAP HINGE
10"
4"
5 3/4"
1 1/8" WOOD BASE
5 3/4"
30"
DETAIL OF VISE ASSEMBLY
②

Felt lined vise to hold racquet handle can be made as shown above from blocks of wood, a thumb screw, and a hinge. Head clamp is made from pieces of strap iron.


MIDDLE OF STRING
④
START OF VERTICAL STRINGS ON FRAME FOR 18 MAIN STRINGS
MIDDLE OF STRING
⑤
START OF VERTICAL STRINGS ON FRAME FOR 20 MAIN STRINGS

If racquet has 18 vertical strings, start them as in Fig. 4; if 16 or 20, begin at throat as in Fig. 5. Thread all vertical strings in loosely before beginning to tighten.

NOW that short working hours are here for everybody, tennis is becoming more popular than ever with thousands and thousands of sports enthusiasts.

Amateur as well as professional tennis players can easily restring their own racquets by following these simple instructions. The process is not complicated, and is extremely fascinating. The whole job will take only about 1½ hours, and will save the restringer up to five dollars.

No experience or expensive equipment is needed. The tools required are: a vise, four ice-picks or restringers' awls, a pair of pliers (if possible, a pair with parallel acting jaws) and a round wooden dowel about an inch and a half in diameter and eight inches long, wrapped with friction tape.

Of course, the most important requisite is the gut used in restringing the racquet. It is made either of silk or sheeps gut. Of the two, the former is the cheaper, the easier to work with, and the most wearable. However, it does not possess quite the liveliness of sheeps gut. The price of

Own TENNIS RACQUET

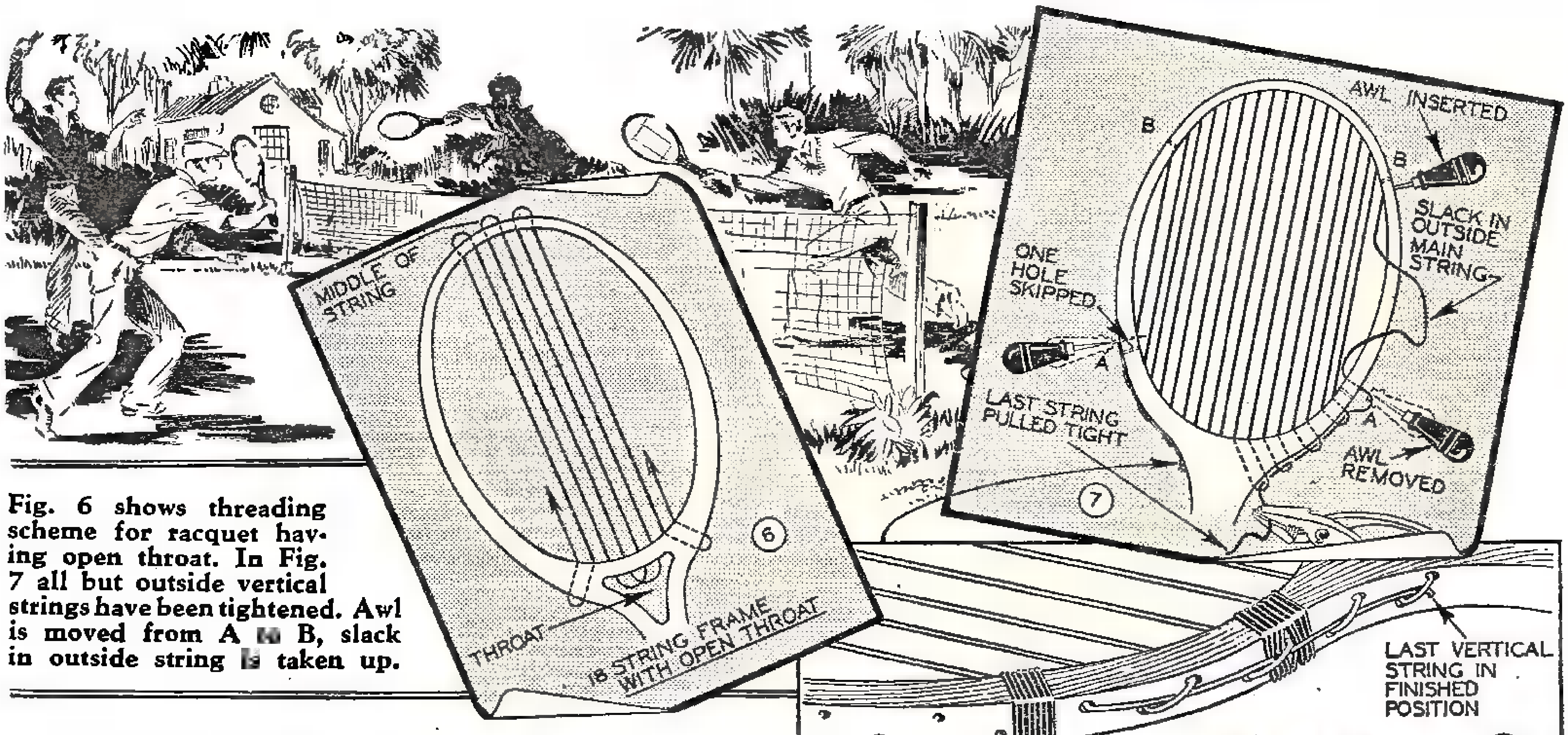

MIDDLE OF STRING
THROAT
18 STRING FRAME WITH OPEN THROAT
6
AWL INSERTED
B
B
SLACK IN OUTSIDE MAIN STRING
ONE HOLE SKIPPED
A
A
LAST STRING PULLED TIGHT
AWL REMOVED
7

Fig. 6 shows threading scheme for racquet having open throat. In Fig. 7 all but outside vertical strings have been tightened. Awl is moved from A to B, slack in outside string is taken up.

the silk will range between 70c and $3.00 and the gut, between $1.25 and $6.00. The cheapest silk string is much to be preferred to the cheaper gut strings.

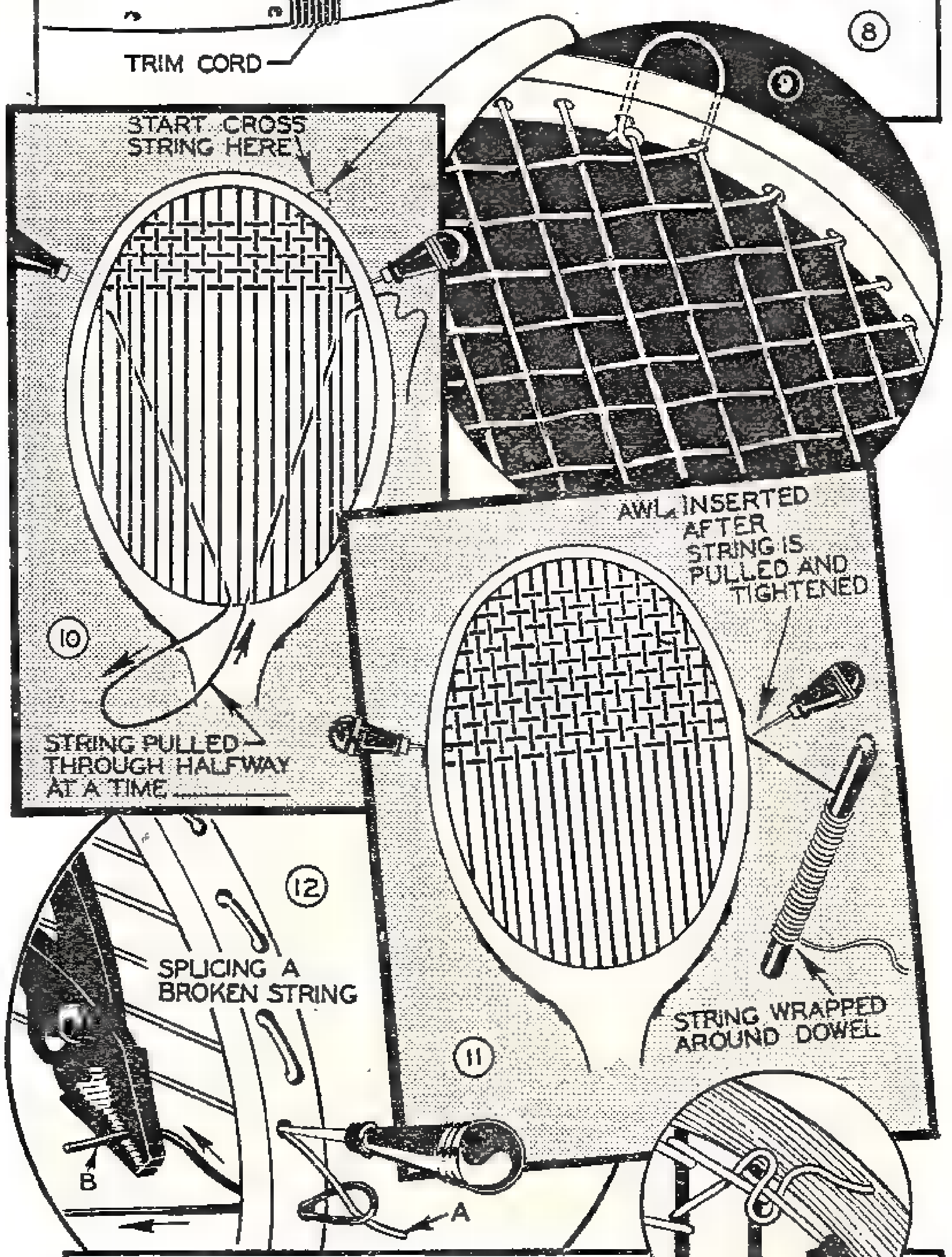
A list of firms selling tennis gut in small quantities will be sent free to those enclosing a stamped envelope. Address MODERN MECHANIX AND INVENTIONS, 529 So. 7th St., Minneapolis, Minn.

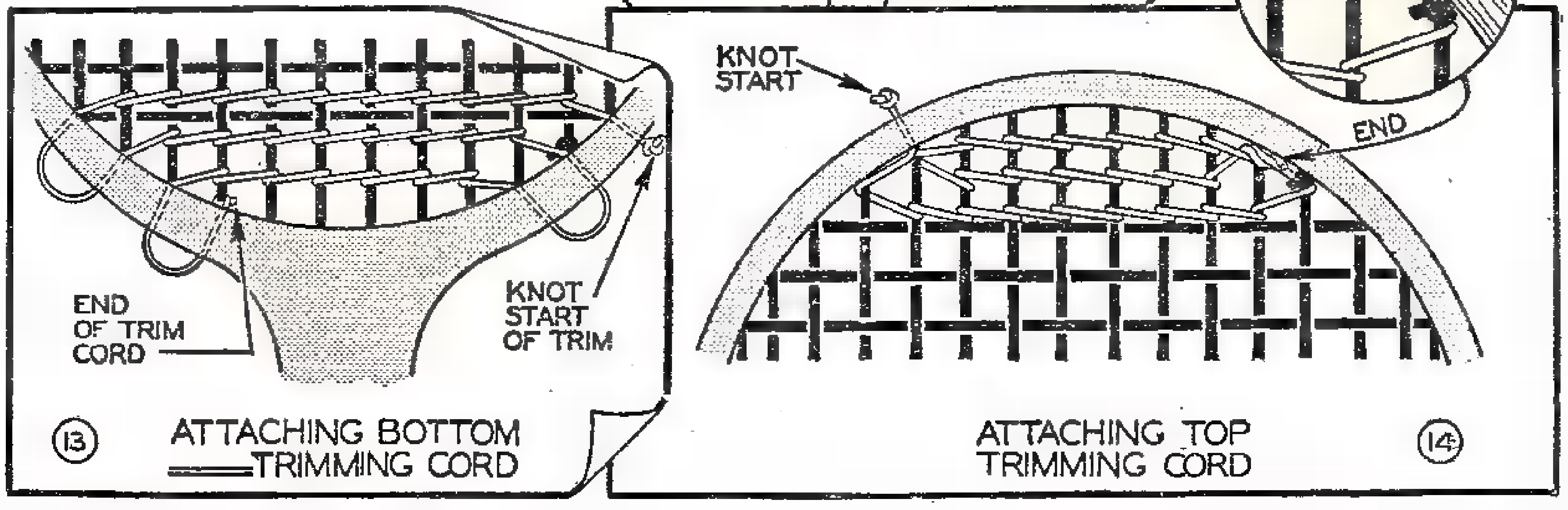
Thirty-six feet of string, preferably in the 15-gauge thickness, are required to string a racquet. Nineteen feet of this is used for the vertical strings, and the remainder for the cross or horizontal strings.

Before restringing, any frame holes that are rough or jagged should be reamed out with an ice-pick.

The equipment needed to hold the racquet must next be prepared. The vise (any small vise) should be fastened to a heavy plank about 12 inches wide and a little longer than the racquet. The plank must be fastened to a firm support. If the reader intends to string a number of racquets he should make a head-clamp. This will be mounted at the end of the plank to hold the head of the racquet in place. When the wing nuts are tightened, the racquet will be held firmly, and any possible warping of the frame will be prevented. A wood clamp is easier to make, but because of its necessarily larg-

(*Cont. on p. 122*)

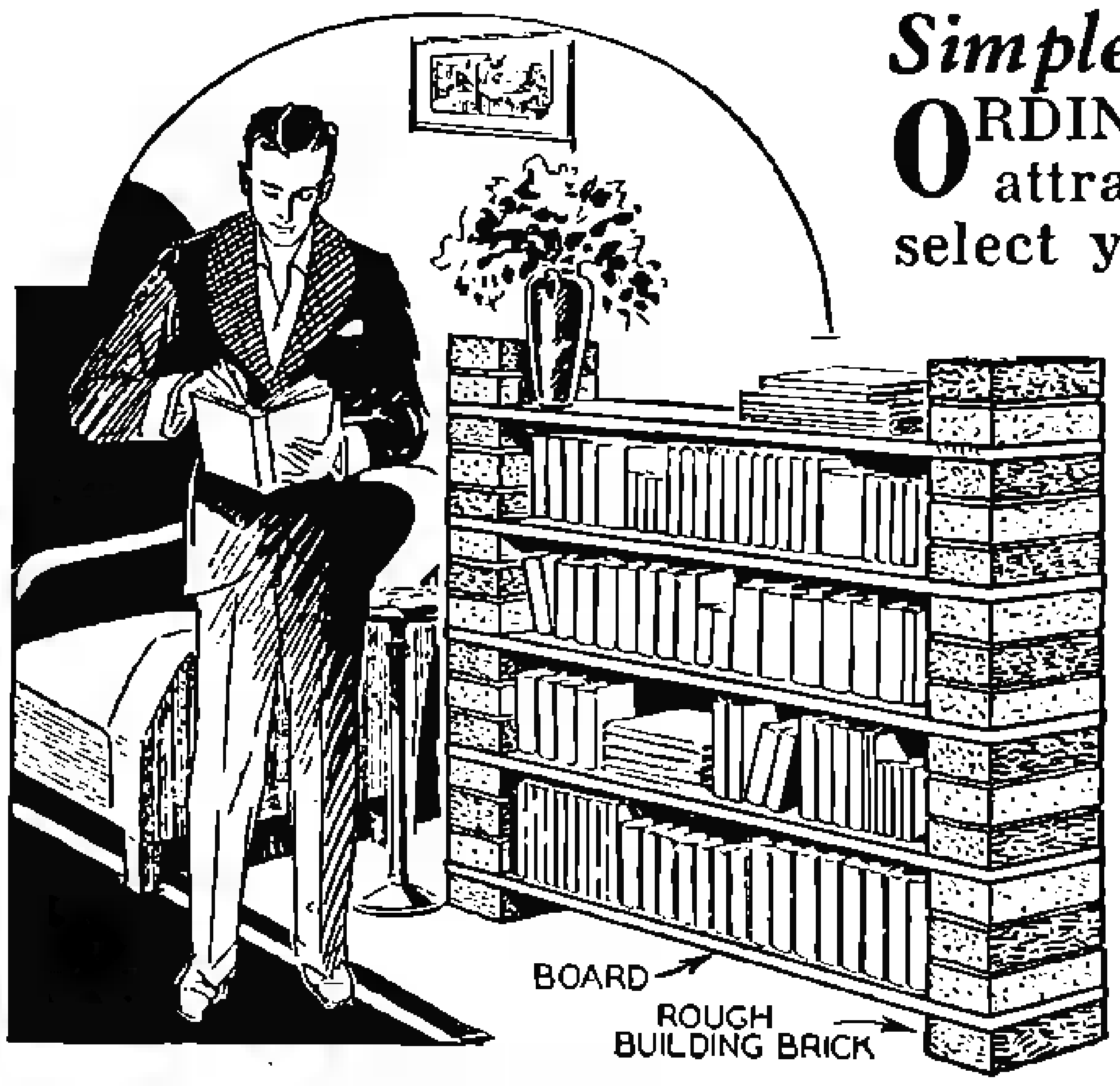

LAST VERTICAL STRING IN FINISHED POSITION
TRIM CORD
8
9
START CROSS STRING HERE
STRING PULLED THROUGH HALFWAY AT A TIME
10
AWL INSERTED AFTER STRING IS PULLED AND TIGHTENED
STRING WRAPPED AROUND DOWEL
11
SPLICING A BROKEN STRING
12
B
A


END OF TRIM CORD
KNOT START OF TRIM
13
ATTACHING BOTTOM TRIMMING CORD
KNOT START
END
ATTACHING TOP TRIMMING CORD
14

Figs. 9 and 10 show beginning of cross strings. Tie knot at fourth vertical string from two center strings. For rapid weaving of cross strings, pull through half way at time. String is wrapped around wood dowel for firm grip when tightening. Broken strings are easily repaired as shown in Fig. 12. Trimming cord may be used at top and bottom to improve appearance.

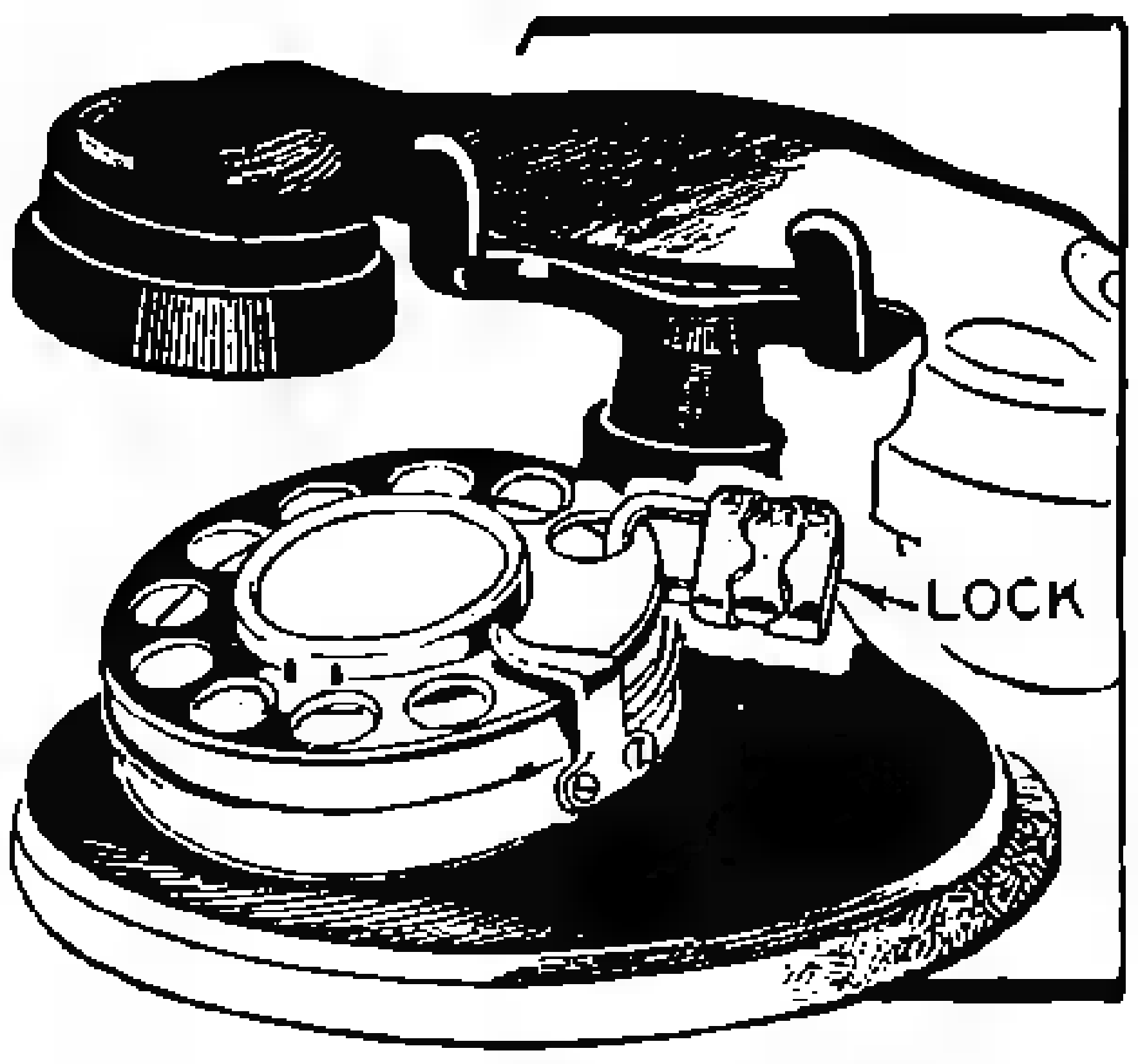
Handikinks for the Home

Simple, Attractive Bookcase Made From Bricks



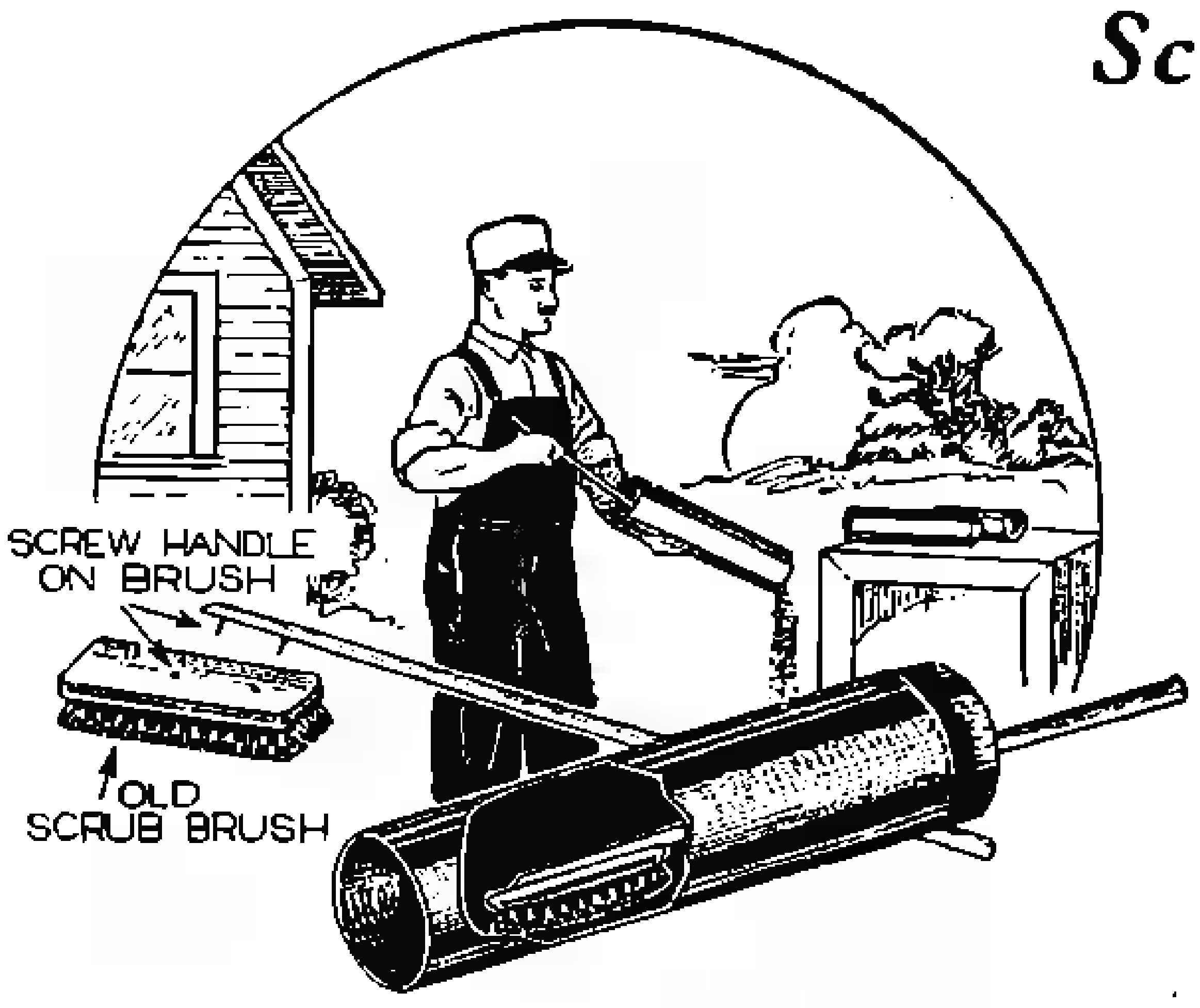
ORDINARY bricks can be used to make a surprisingly attractive bookcase for den or living room. When you select your bricks pick colors that will harmonize with the furnishings of the room. Take five boards of the desired length, and as wide as your bricks are long. Place one brick on each end for the base, three bricks between shelves, and two on top. A coat of paint for the boards completes the job. The same idea may be used for shelves in the basement, garage, or workshop. Bricks may be given coat of varnish if desired.—N. Christensen.

Telephone Lock



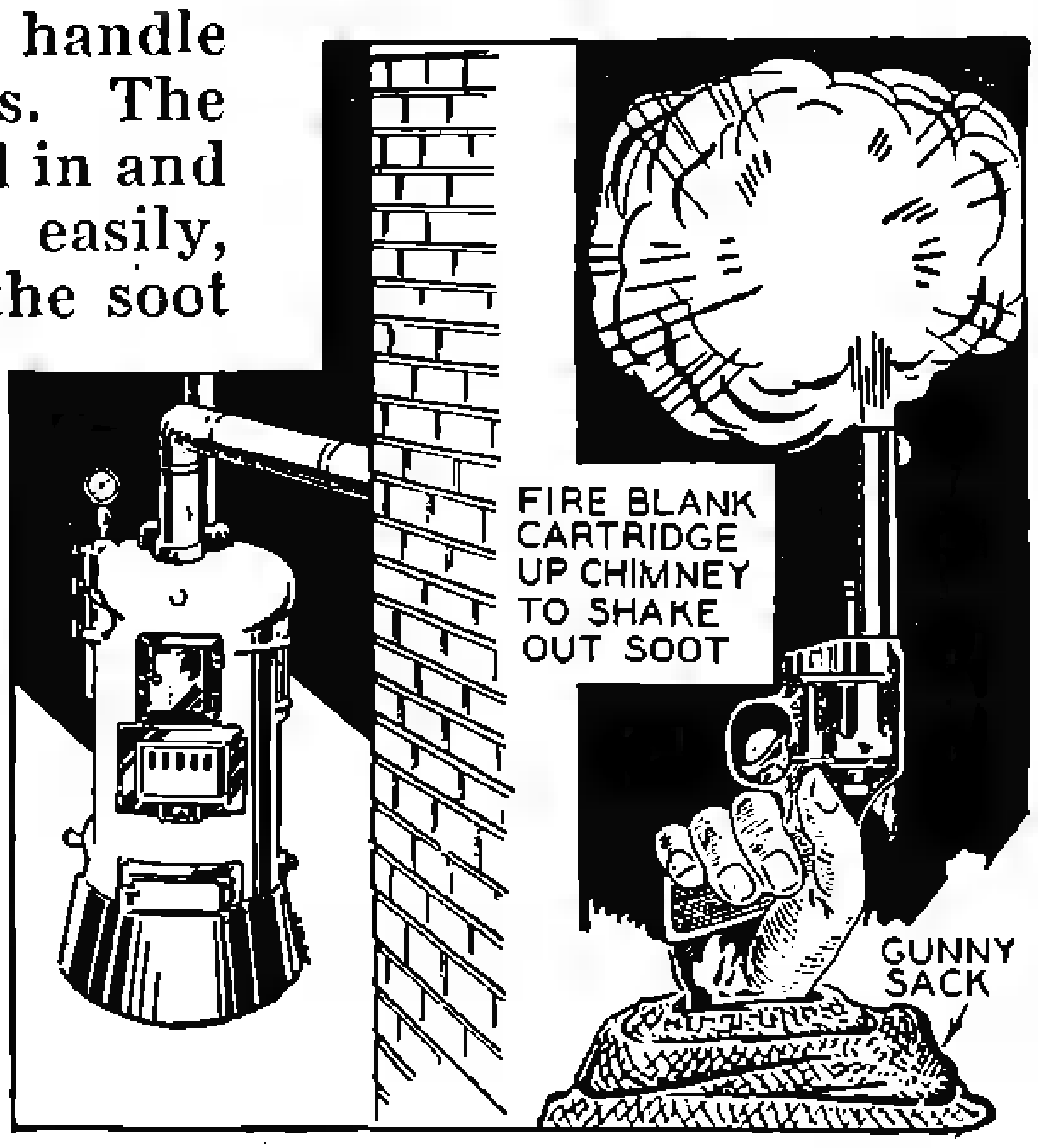
SINCE telephone companies are charging according to the number of calls made, it is often desired to stop unauthorized local and long-distance calls. This can easily be done by snapping a small padlock into the first hole on the telephone dial.—W. V. Gray.

Scrub Brush Is Handy for Cleaning Stove Pipes



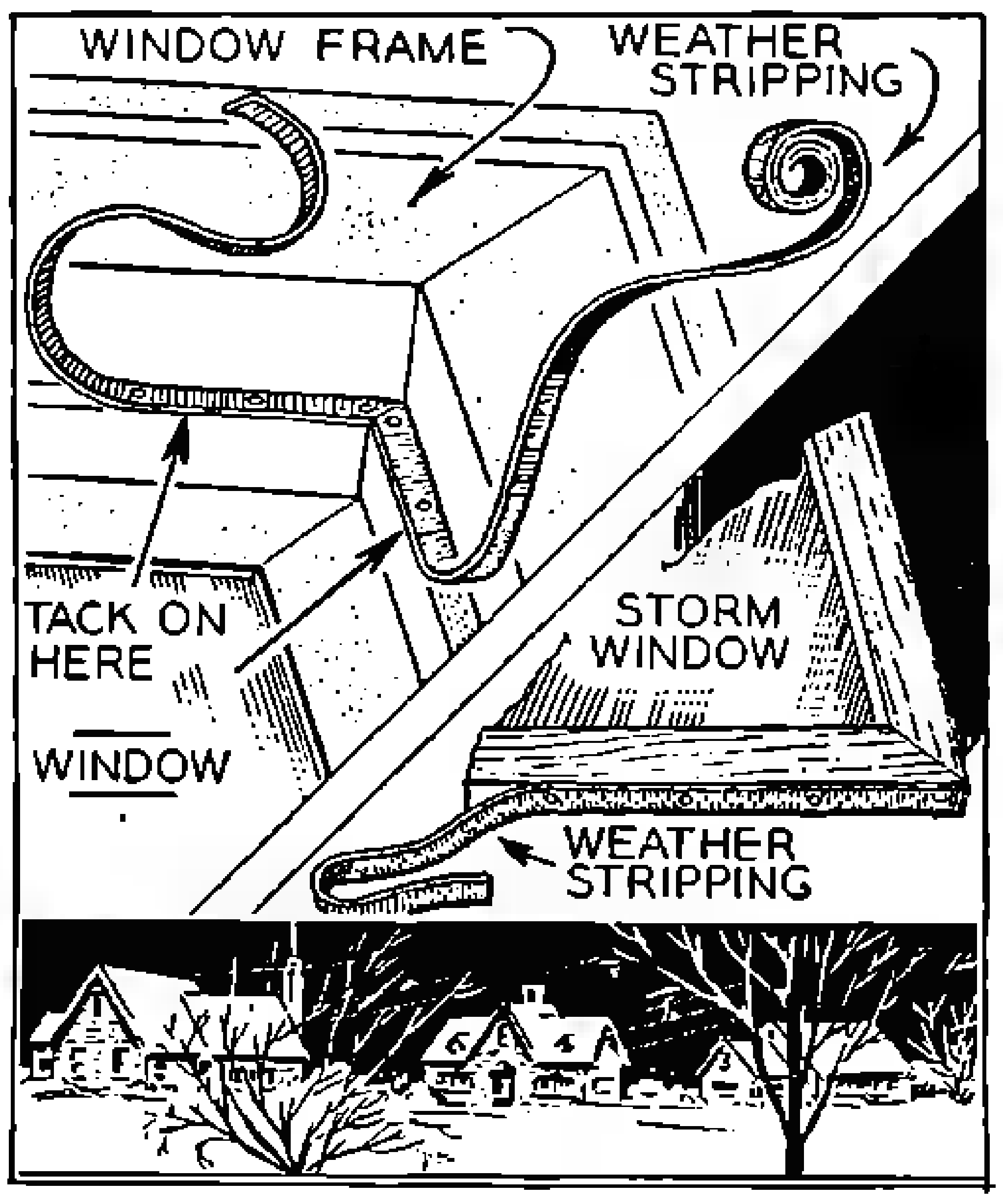
THE annual spring cleaning of the stove pipes is always a messy job, especially if the soot has to be pounded out. Take a discarded scrub brush and fasten to a four-foot handle with wood screws. The brush can be slipped in and out of the pipes easily, cleaning out all of the soot with a minimum of dust flying about.—O. E. Olson.

Blank Cartridges Clean Chimney of Soot


FIRE BLANK CARTRIDGE UP CHIMNEY TO SHAKE OUT SOOT
GUNNY SACK

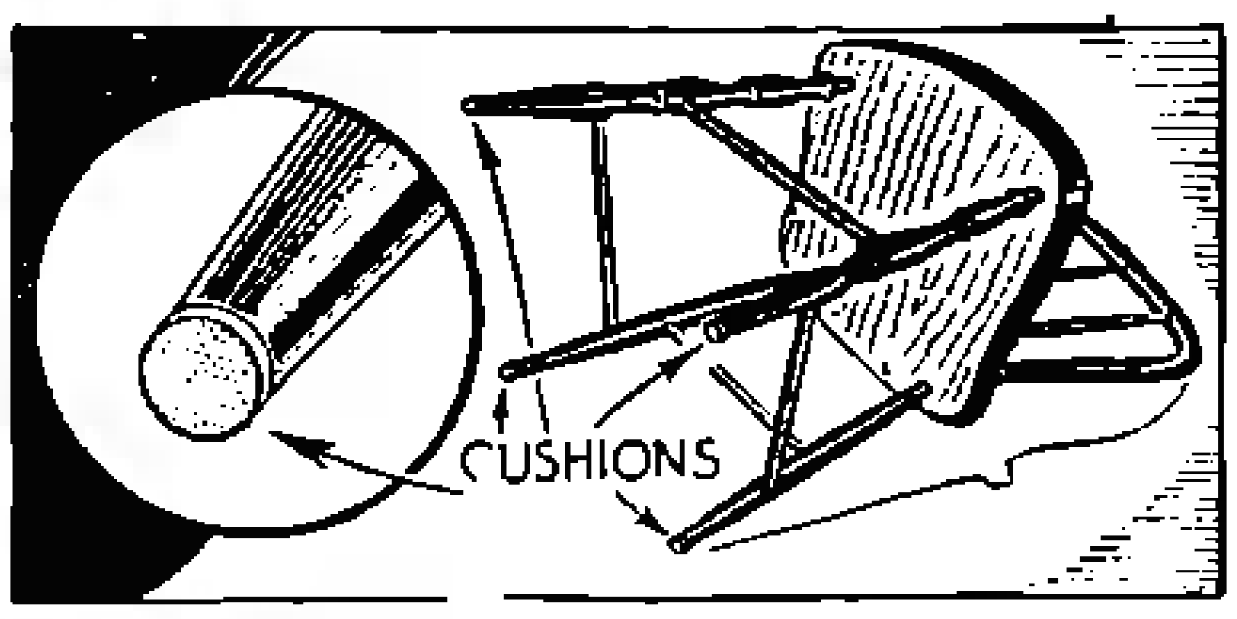
THE annual chimney cleaning ritual can be forgotten. Just secure a revolver and about three blank cartridges, preferably of 32 calibre. Holding the revolver in your hand, reach into the opening at the bottom of the chimney. Place a burlap bag around your arm to completely close the opening and fire three shots up the chimney.—Clair L. Wade.

Install Weather Stripping Now for Next Winter



A GOOD job of weather stripping can be done on any window with little labor or expense. Since this protection from cold is needed only in winter, it can be put on the storm windows. Nail almost any kind of felt or rubber weather stripping on the top and sides of the window casement. Fasten the bottom strip on the bottom edge of the storm window, instead of the sill, to permit rainwater to run off in summer.—R. J. Madison.

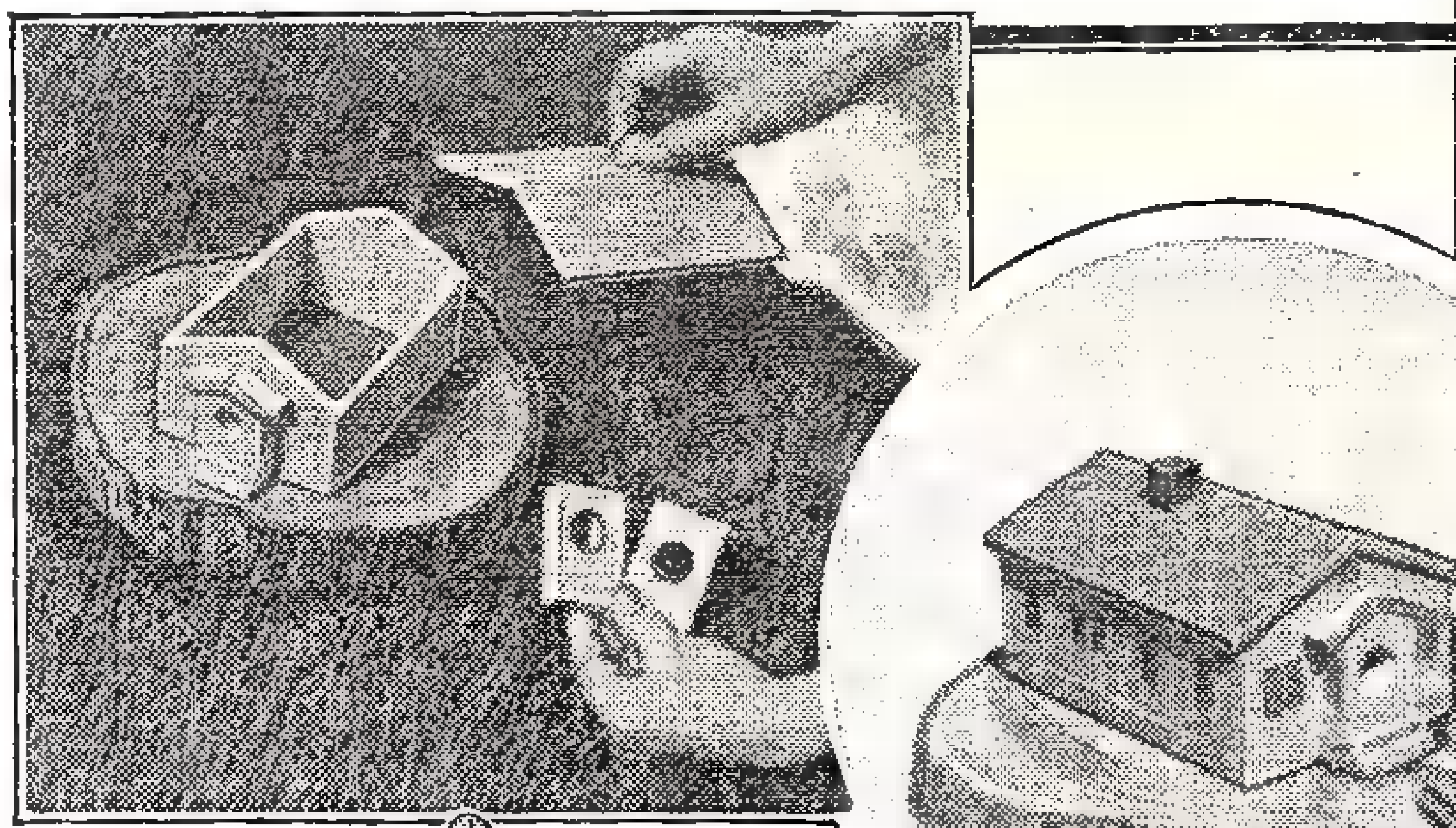
Put Felt on Chair Legs



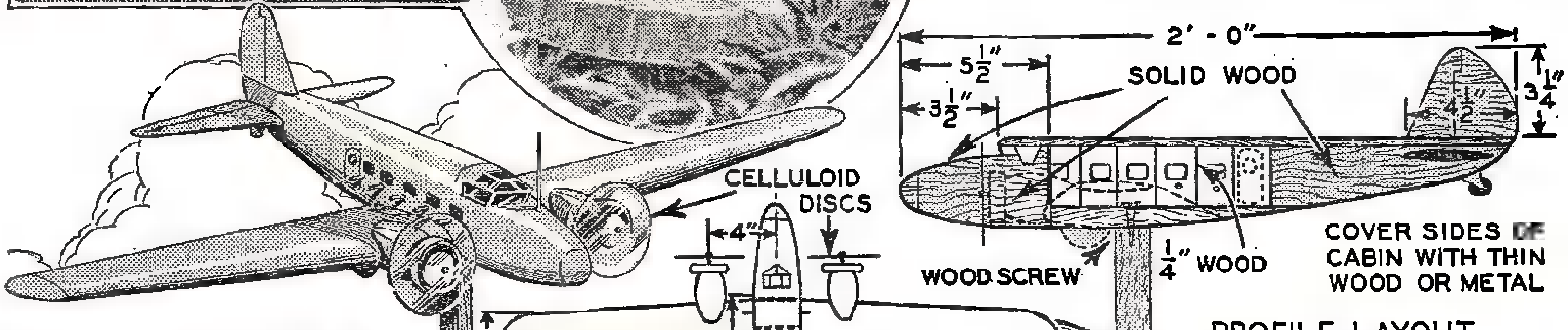
TO PREVENT chairs from scratching hardwood floors, glue scrap pieces of felt on the bottoms of the chair legs.—C. McFarlin.

Novel BACK YARD BIRD HOUSES

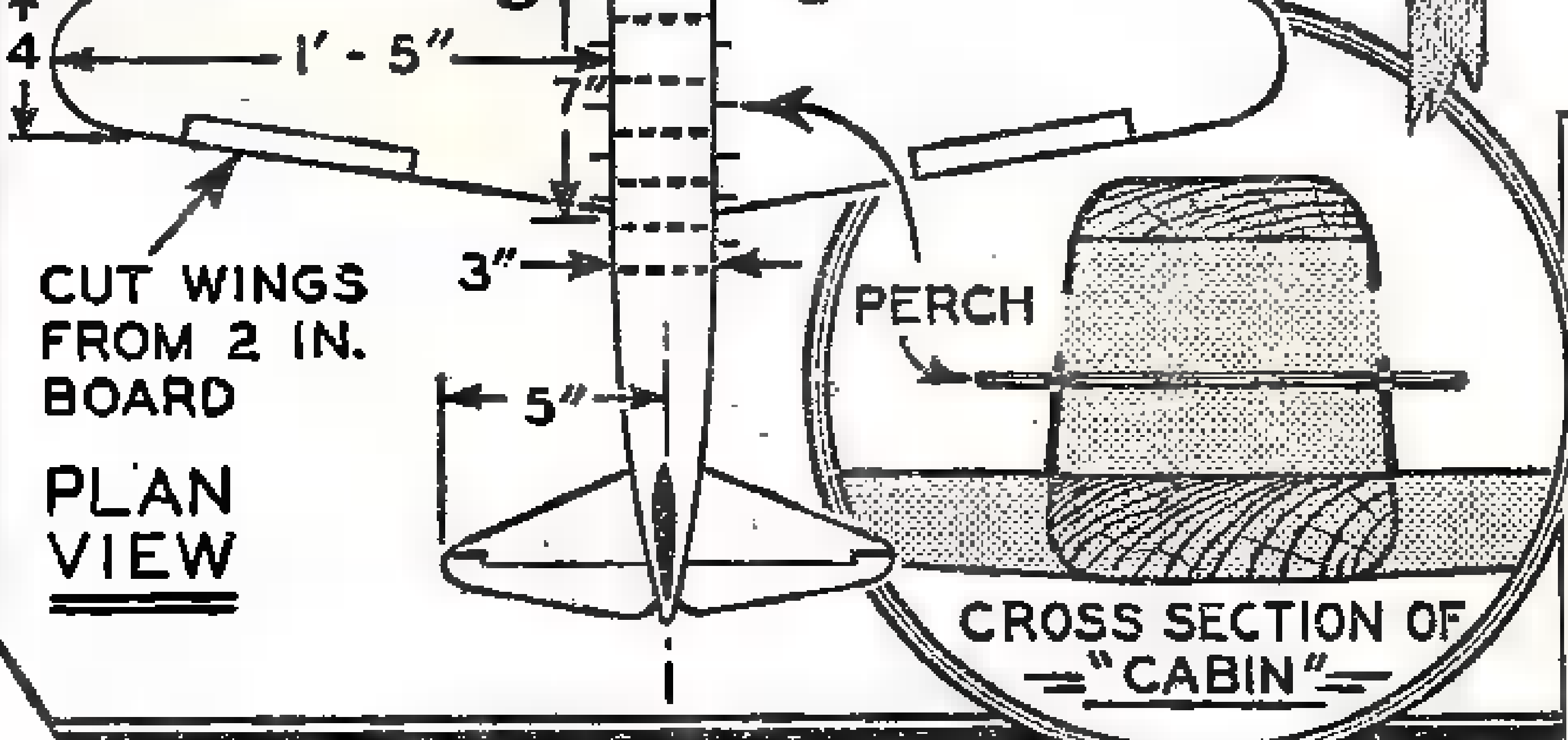
These new bird house designs will look well in any backyard garden, and will at the same time provide comfortable homes for many beautiful song birds.



Bird-house replica of above home, made in scale of 60 to 1, has removable roof for cleaning. Change doors for various kinds of birds.

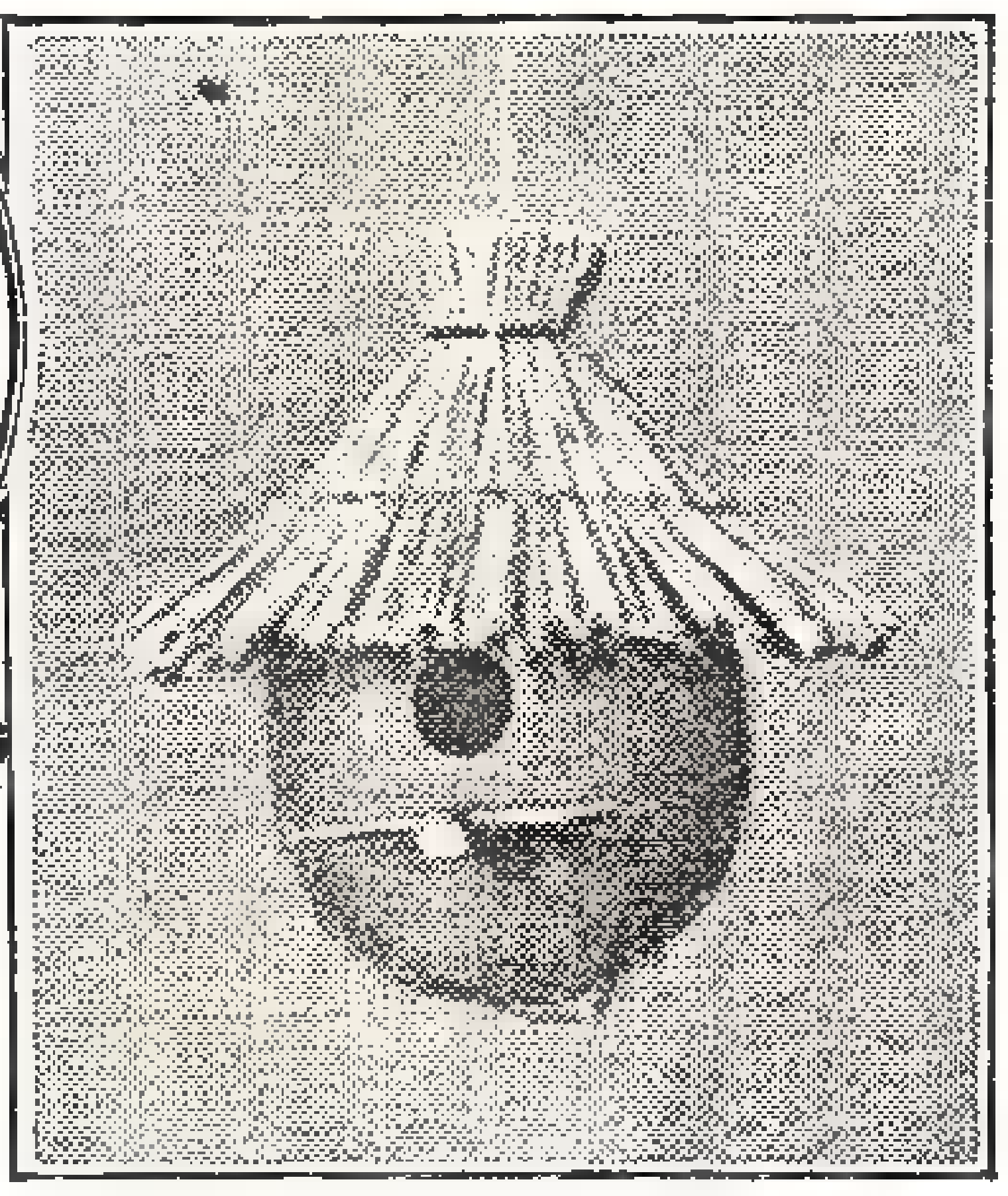


2' - 0"
5½"
3½"
SOLID WOOD
1"
4½"
3¼"
CELLULOID DISCS
WOOD SCREW
¼" WOOD
COVER SIDES OF CABIN WITH THIN WOOD OR METAL
PROFILE LAYOUT

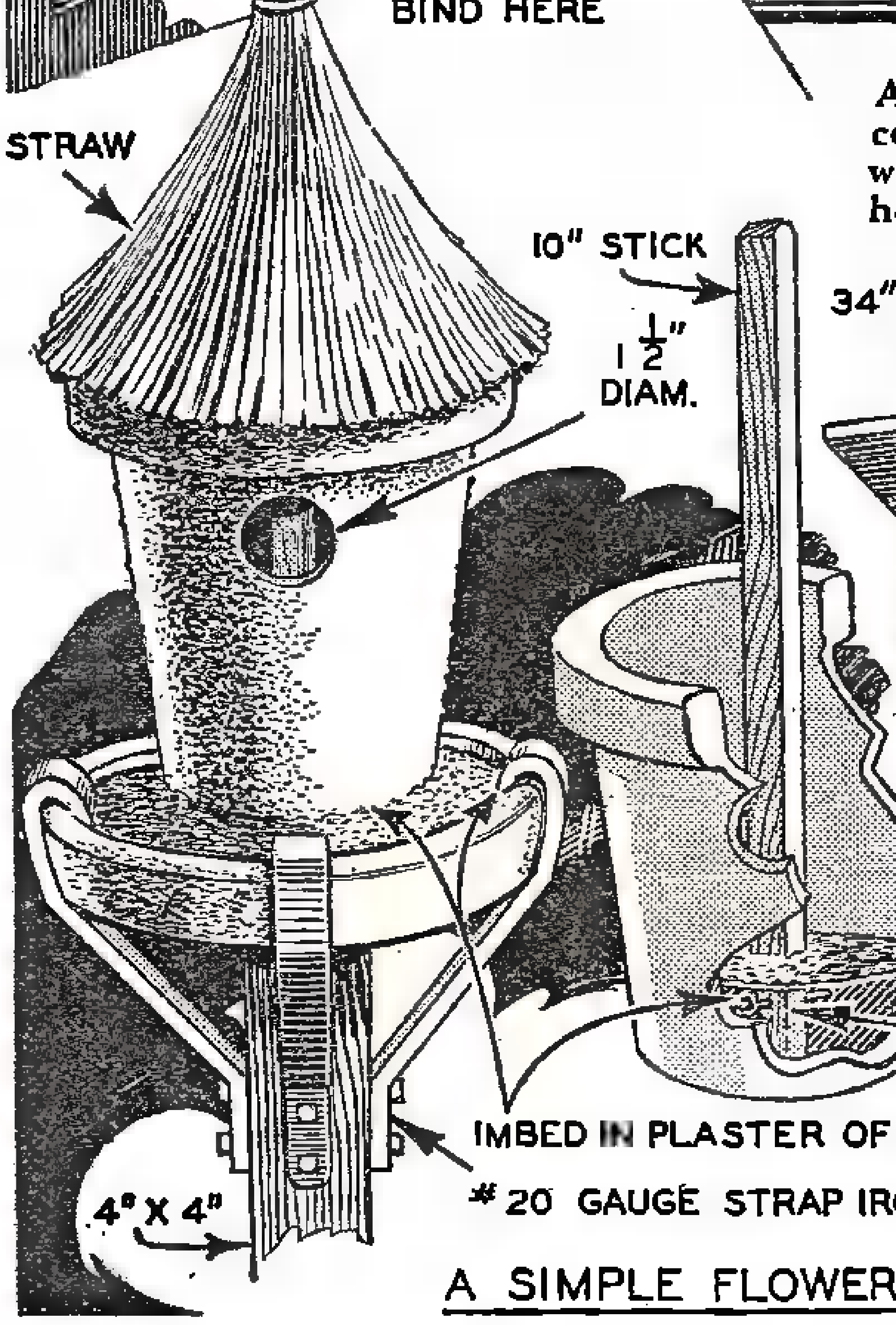


4"
4
1' - 5"
7"
3"
5"
CUT WINGS FROM 2 IN. BOARD
PERCH
PLAN VIEW
CROSS SECTION OF "CABIN"

This silvery Boeing air liner model makes an ideal apartment home for martins. Carve nose from wood; body from tin or wood; partitions of ¼" plywood. Use celluloid discs to stimulate propellers in motion. Mount high on post, as martins prefer to be isolated.

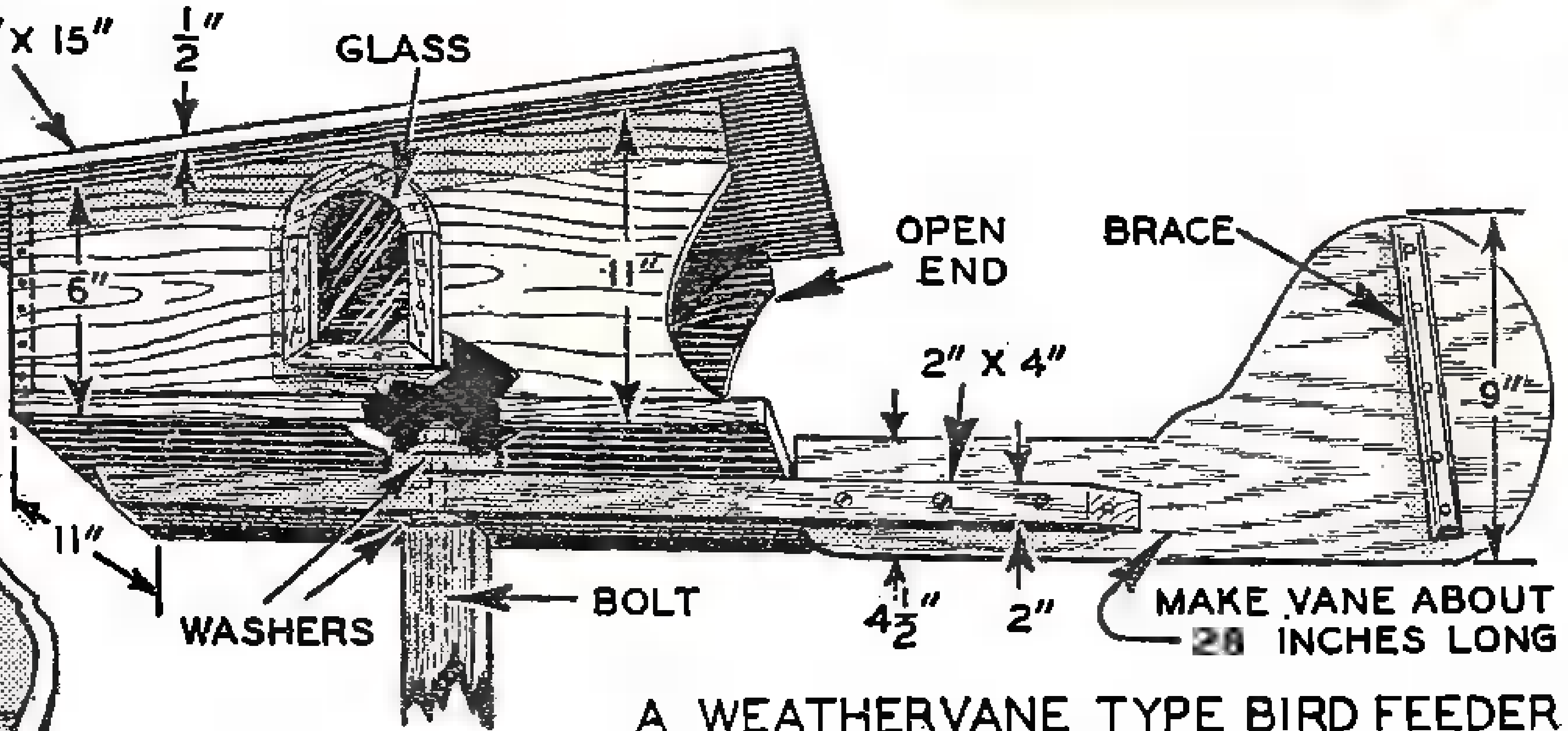


Attractive wren house is easily made from cocoanut. Bore 1" hole in side, loosen meat with screwdriver, and pull out with wire hook. Glue on straw roof, and attach perch.



BIND HERE
STRAW
10" STICK
1½" DIAM.
LARGE NAIL
IMBED IN PLASTER OF PARIS
#20 GAUGE STRAP IRON
4"X 4"
A SIMPLE FLOWER POT NEST

Flower pot wren house, with thatched roof, looks well on any post. Shellac straw roof, and paint pot green or brown. Imbed stick supporting straw roof, strap iron supports, and clay flower pot in plate or pan filled with plaster of Paris.



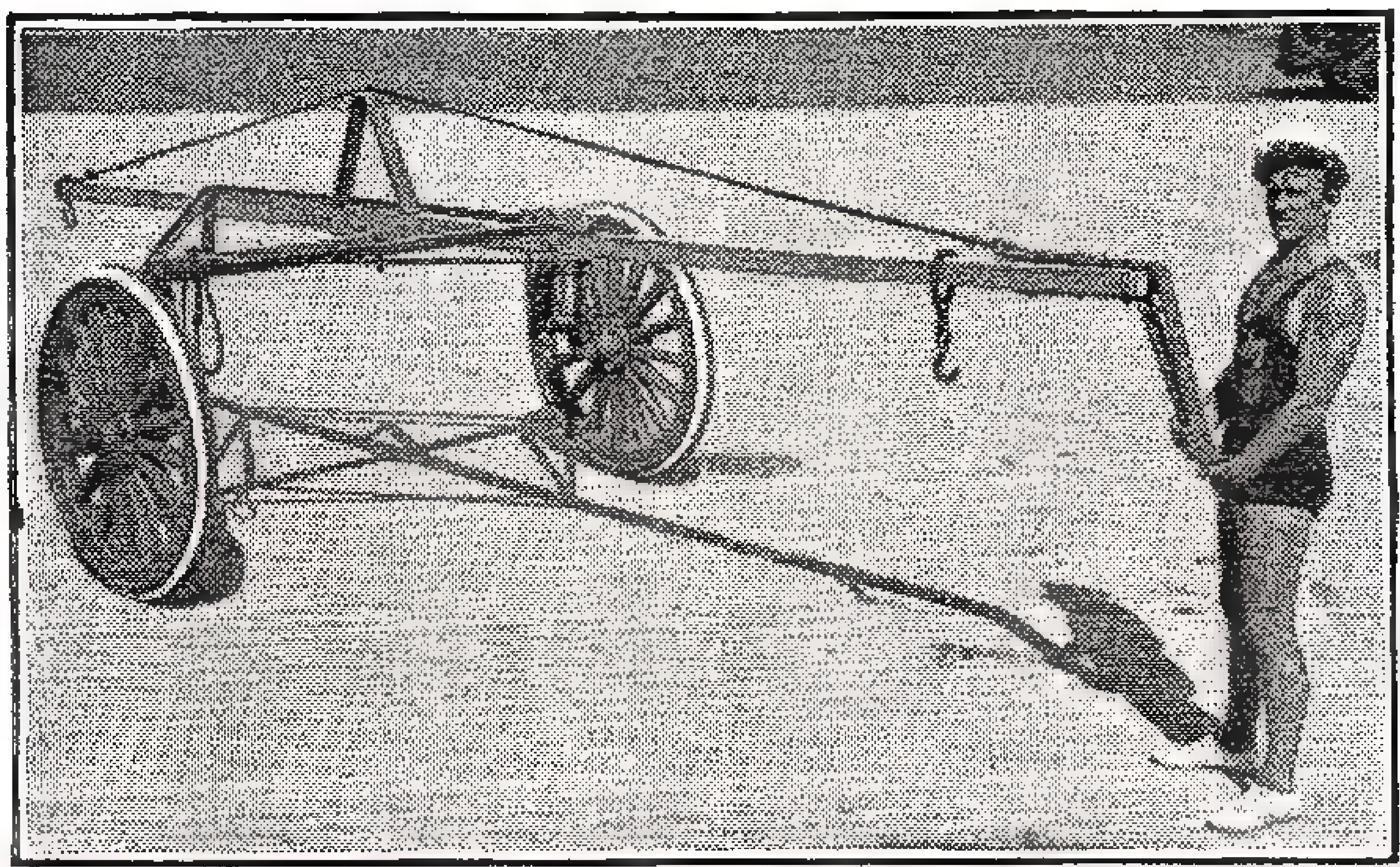
34"X 15"
½"
GLASS
6"
11"
OPEN END
BRACE
2" X 4"
9"
11"
WASHERS
BOLT
4½"
2"
MAKE VANE ABOUT 28 INCHES LONG
A WEATHERVANE TYPE BIRD FEEDER

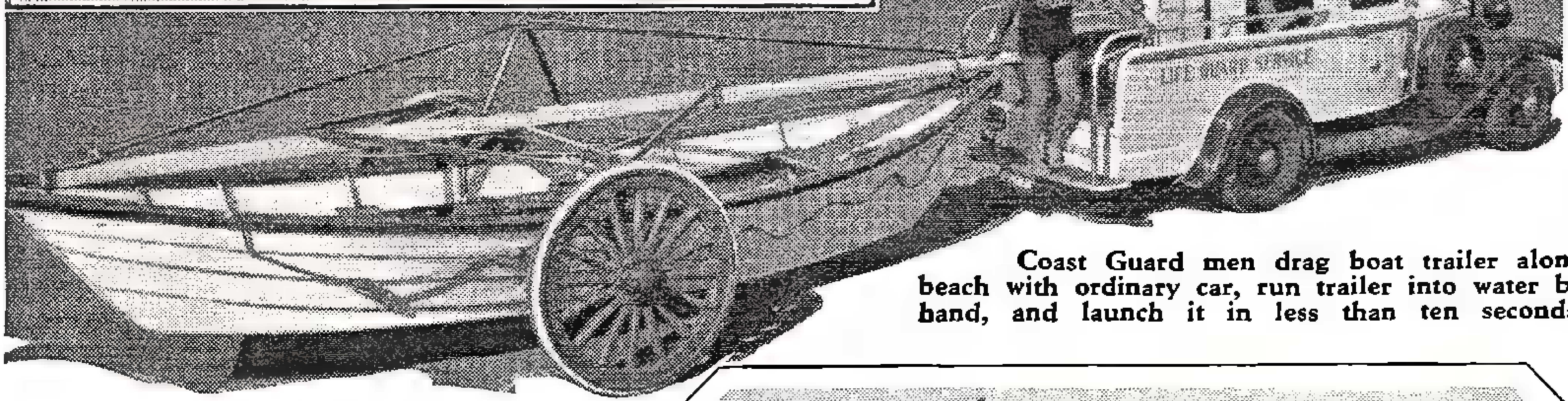
This sheltered feeder will be popular both summer and winter with birds. Mount 8' above ground to protect from cats.

OUR feathered friends are seldom particular as to where they nest; a clean home painted in dull colors, and mounted in some isolated spot, will bring them. Only the ingenuity of the builder limits the unusual designs possible for a bird house.

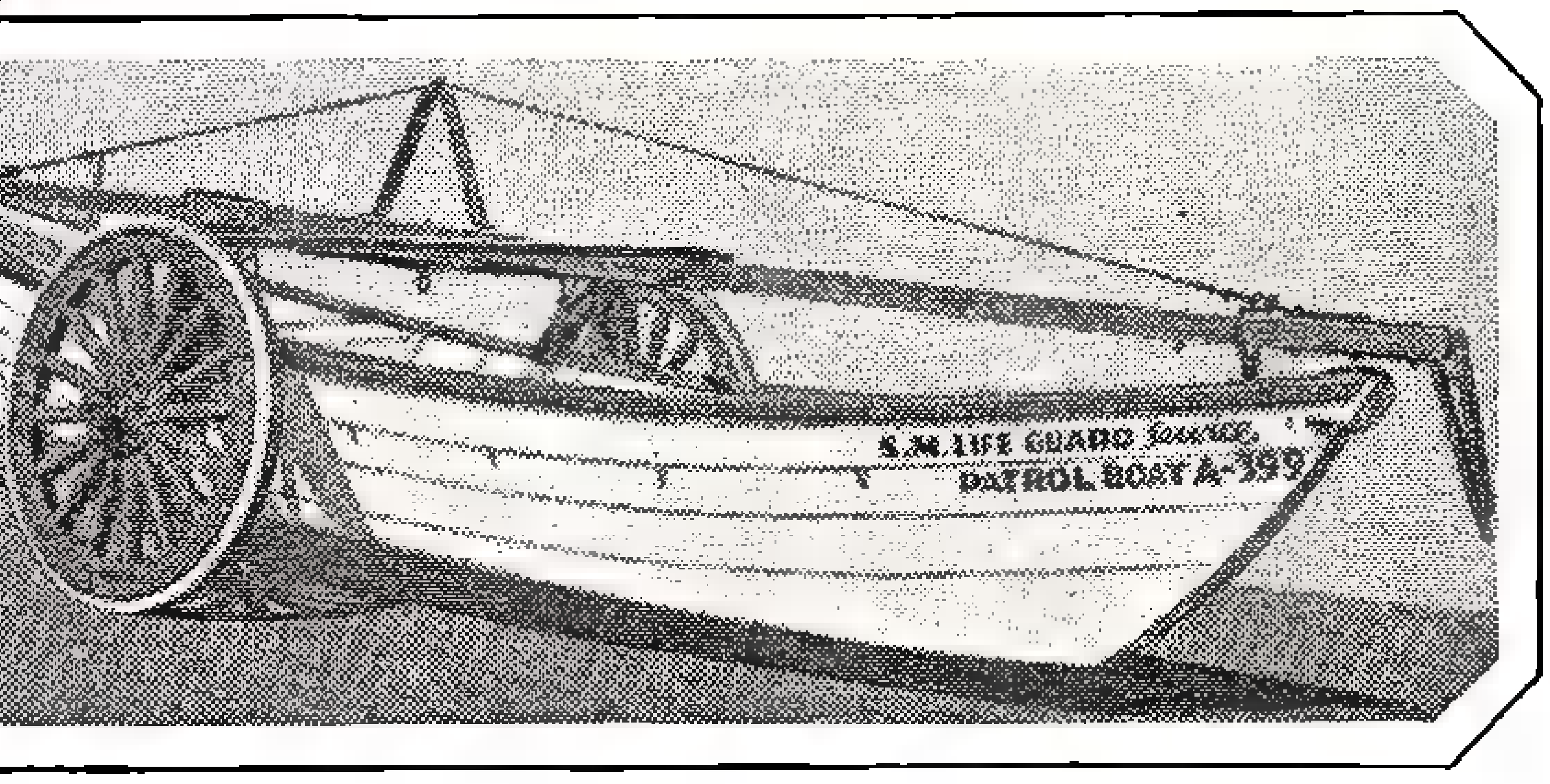
Build a Suspension Trailer

Boats weighing up to 600 pounds can be launched or taken out of water in 10 seconds with this easily built suspension trailer. Tremendous leverage of beam allows a man to raise a heavy boat into position.

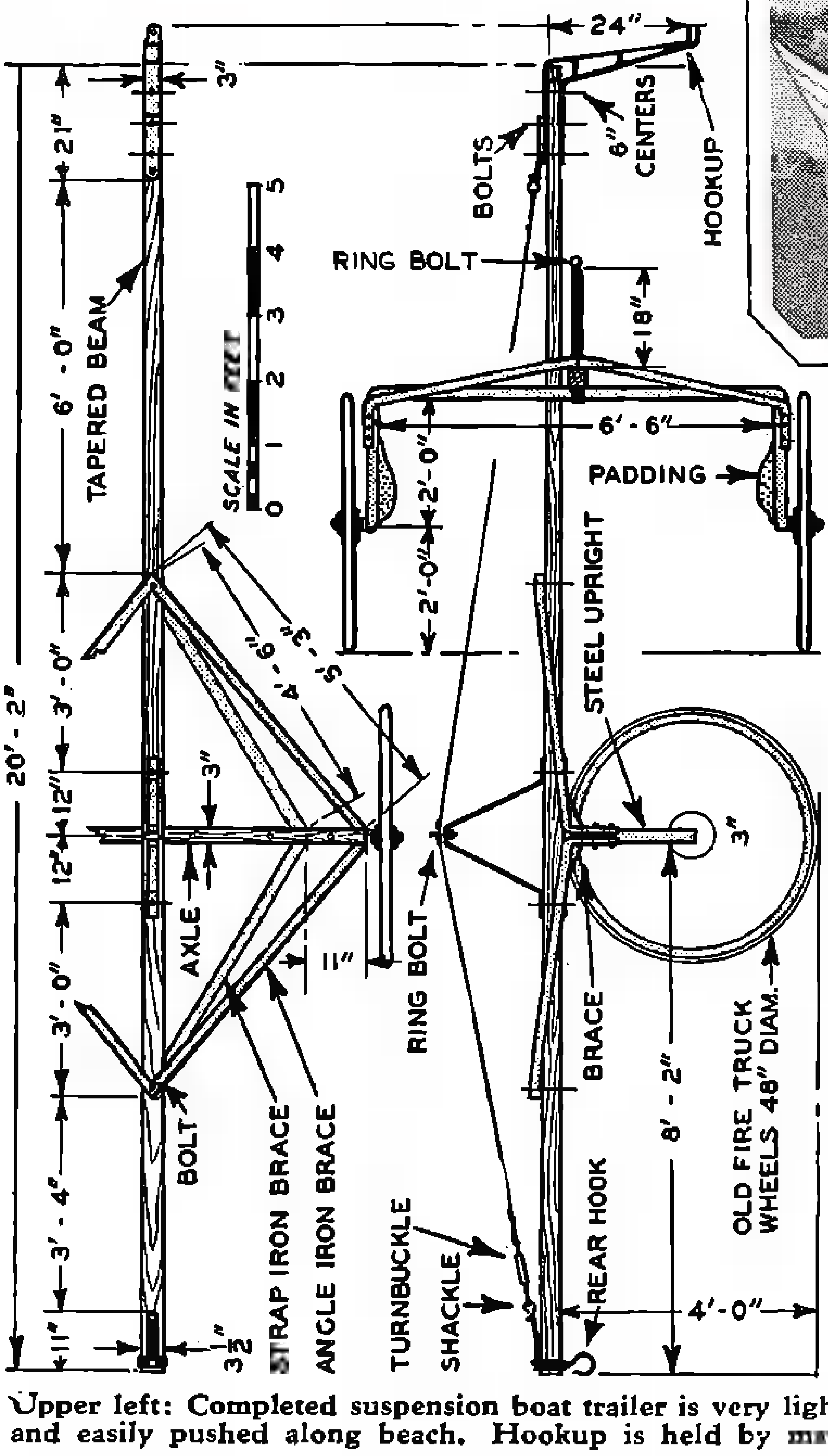




Coast Guard men drag boat trailer along beach with ordinary car, run trailer into water by hand, and launch it in less than ten seconds.



A 20-ft. Coast Guard boat suspended from the trailer. Steel cable carries most of 600-lb. load, permitting small beam.


24"
3"
21"
TAPERED BEAM
6'-0"
SCALE IN FEET
0 1 2 3 4 5
BOLTS
6" CENTERS
HOOKUP
RING BOLT
18"
6'-6"
2'-0"
PADDING
2'-0"
STEEL UPRIGHT
5'-3"
4'-9"
3'-0"
20'-2"
12"
3"
12"
AXLE
11"
RING BOLT
3"
3'-0"
BRACE
8'-2"
OLD FIRE TRUCK WHEELS 48" DIAM.
BOLT
3'-4"
STRAP IRON BRACE
ANGLE IRON BRACE
TURNBUCKLE
SHACKLE
REAR HOOK
4'-0"
11"
3½"

Upper left: Completed suspension boat trailer is very light, and easily pushed along beach. Hookup is held by man.

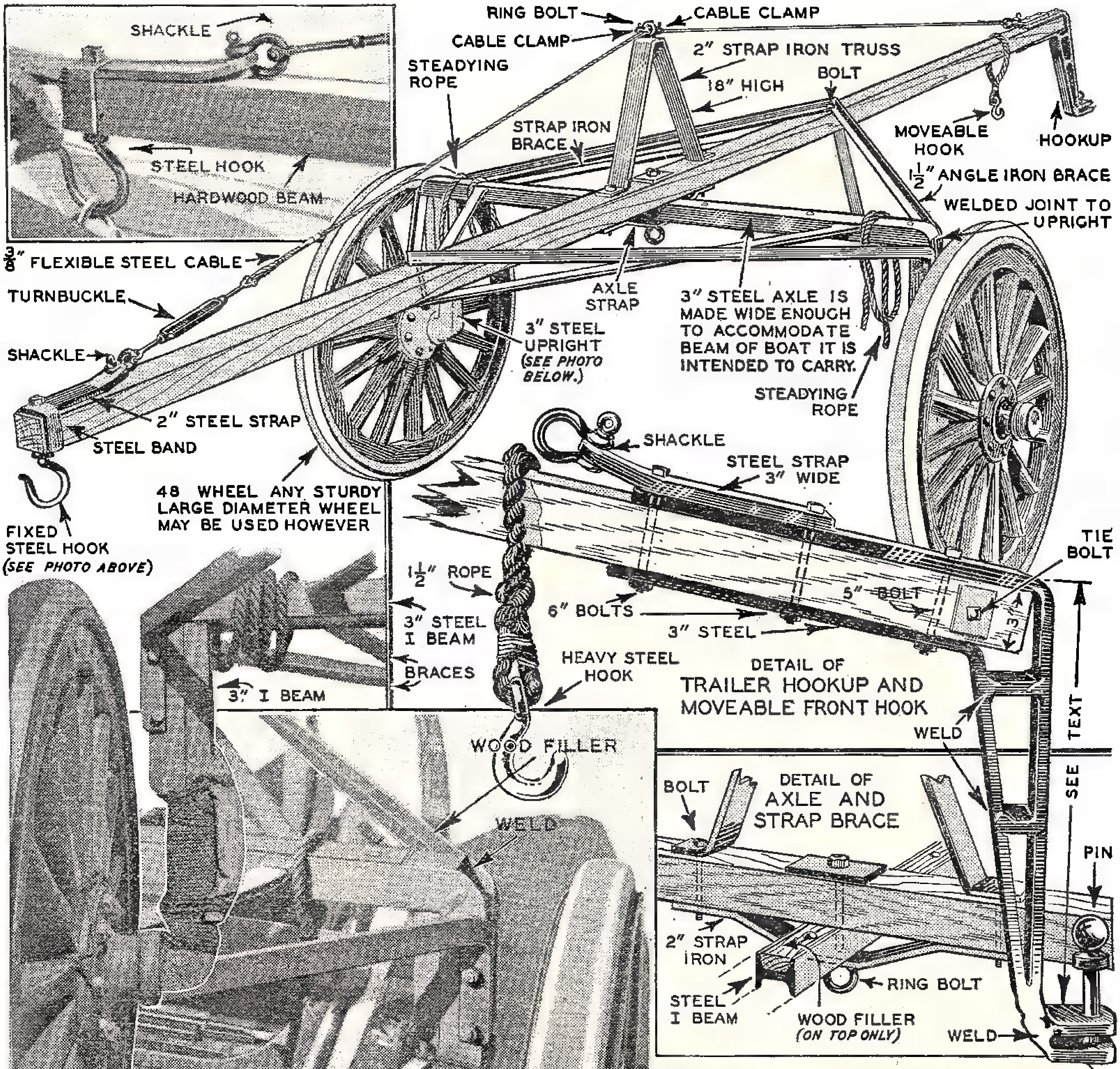
A CALL comes in to life guard headquarters that a small boat is in distress off some lonely spot on the sea beach. Lives are in danger, and every second counts. A seaworthy patrol boat must be picked up on a carrier on a moment's notice, towed by automobile to a point on the beach near the scene of the accident, and hurriedly launched in the surf.

George Watkins, chief of the Santa Monica, California, Life Guard Service, solved this problem by designing the suspension boat trailer. With it a 20-foot dory or skiff weighing more than 600 pounds can be lifted from the ground or shallow water into carrying position in less than 10 seconds by ONE man! The launching of a boat requires even less time.

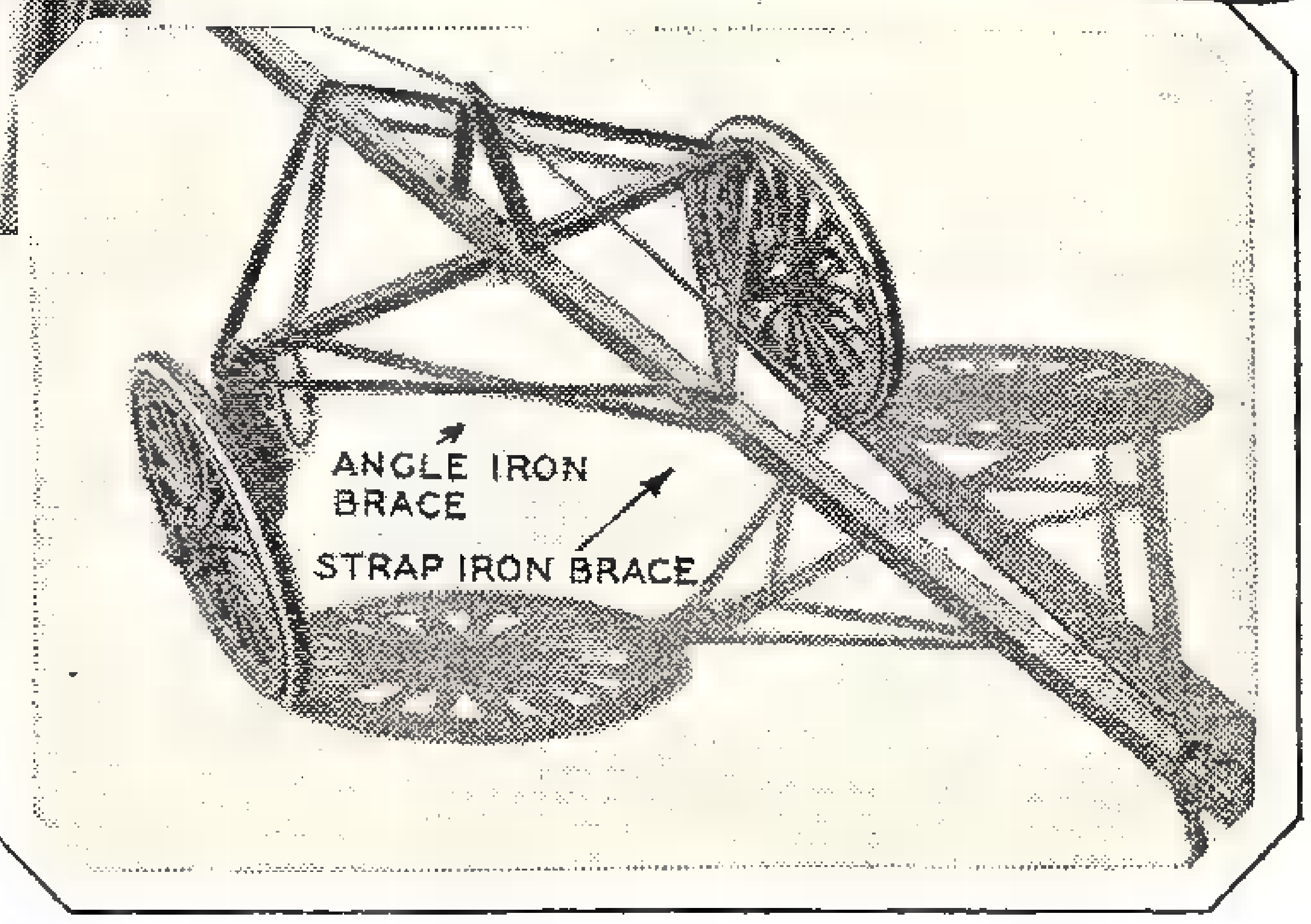
The suspension boat trailer is, primarily, a long, reinforced wood beam, fixed upon a steel axle which has been raised sufficiently high above the wheel hubs to clear the ends and freeboard of the craft to be car-

for Your Boat

by
PAUL W. GARTNER


SHACKLE
STEEL HOOK
HARDWOOD BEAM
RING BOLT
CABLE CLAMP
CABLE CLAMP
STEADYING ROPE
2" STRAP IRON TRUSS
18" HIGH
BOLT
STRAP IRON BRACE
MOVEABLE HOOK
HOOKUP
1½" ANGLE IRON BRACE
WELDED JOINT TO UPRIGHT
⅜" FLEXIBLE STEEL CABLE
TURNBUCKLE
SHACKLE
AXLE STRAP
3" STEEL UPRIGHT (SEE PHOTO BELOW.)
3" STEEL AXLE IS MADE WIDE ENOUGH TO ACCOMMODATE BEAM OF BOAT IT IS INTENDED TO CARRY.
STEADYING ROPE
2" STEEL STRAP
STEEL BAND
48 WHEEL ANY STURDY LARGE DIAMETER WHEEL MAY BE USED HOWEVER
FIXED STEEL HOOK (SEE PHOTO ABOVE)
SHACKLE
STEEL STRAP 3" WIDE
TIE BOLT
1½" ROPE
3" STEEL I BEAM
BRACES
3" I BEAM
6" BOLTS
5" BOLT
3" STEEL
3"
HEAVY STEEL HOOK
DETAIL OF TRAILER HOOKUP AND MOVEABLE FRONT HOOK
SEE TEXT
WOOD FILLER
WELD
WELD
BOLT
DETAIL OF AXLE AND STRAP BRACE
PIN
2" STRAP IRON
STEEL I BEAM
RING BOLT
WOOD FILLER (ON TOP ONLY)
WELD
PADDING

Close-up view showing steel framework of trailer. Framework is padded to prevent boat from being scratched. Fire engine wheels are used here, but large auto wheels will do.


ANGLE IRON BRACE
STRAP IRON BRACE

Another view of trailer frame, showing how steel braces from beam to axle add rigidity to the suspension assembly.

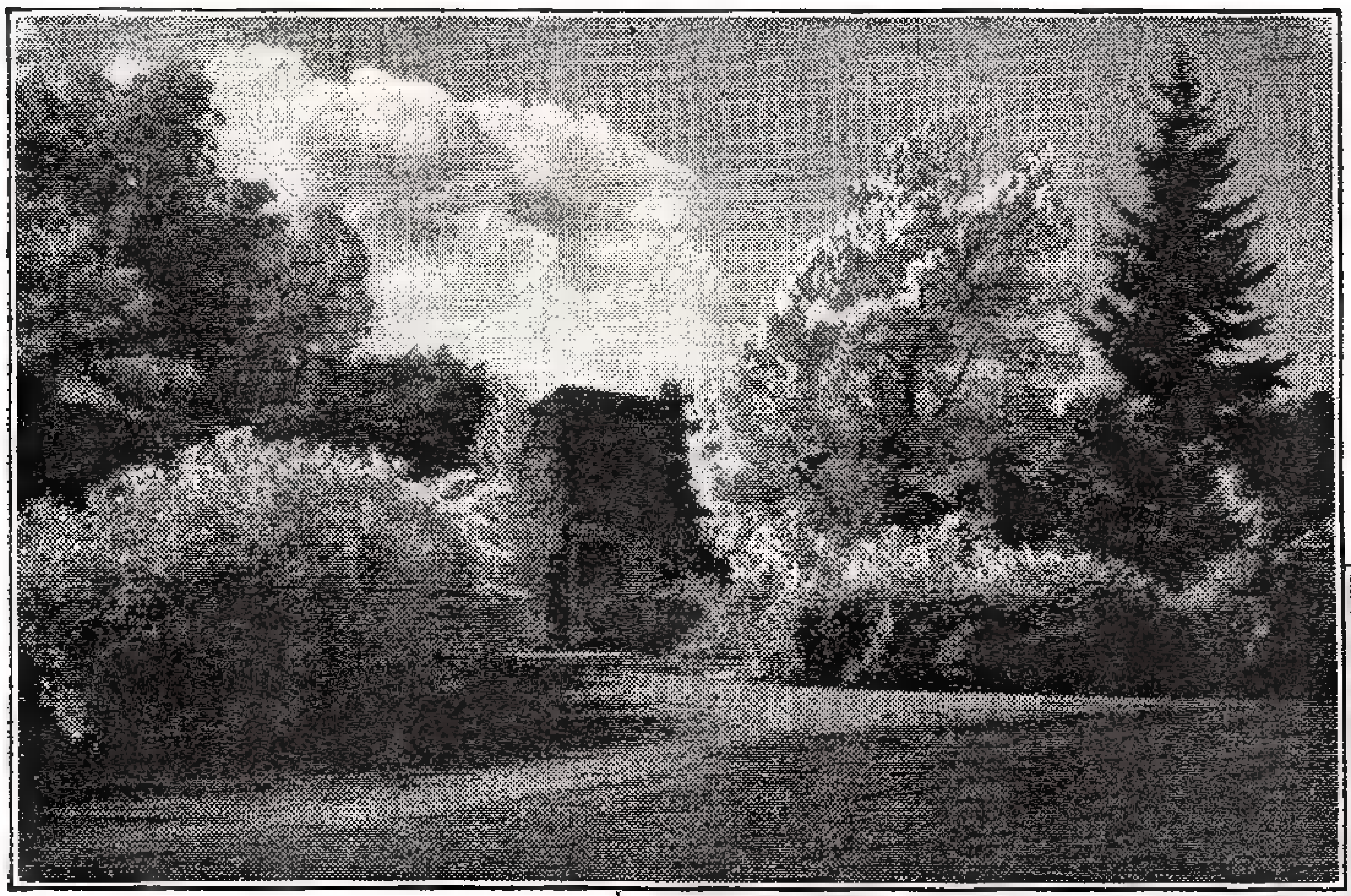
ried. The rig is simply rolled above the boat, and a fixed hook at the rear extremity of the beam is joined to a steel ring or loop of heavy line attached to the stern of the craft. The leverage of the beam makes it practical for a man of average weight to raise the stern of the boat. Then a movable forward hook is readily fastened to a ring in the bow, and the lift has been accomplished in a very few seconds. Lines dropped from the axle are tied to the gunnels to snub side motion. The weight is so balanced that a single man can raise the forward end when hooking the trailer to an automobile.

Since this carrier was designed to accom-

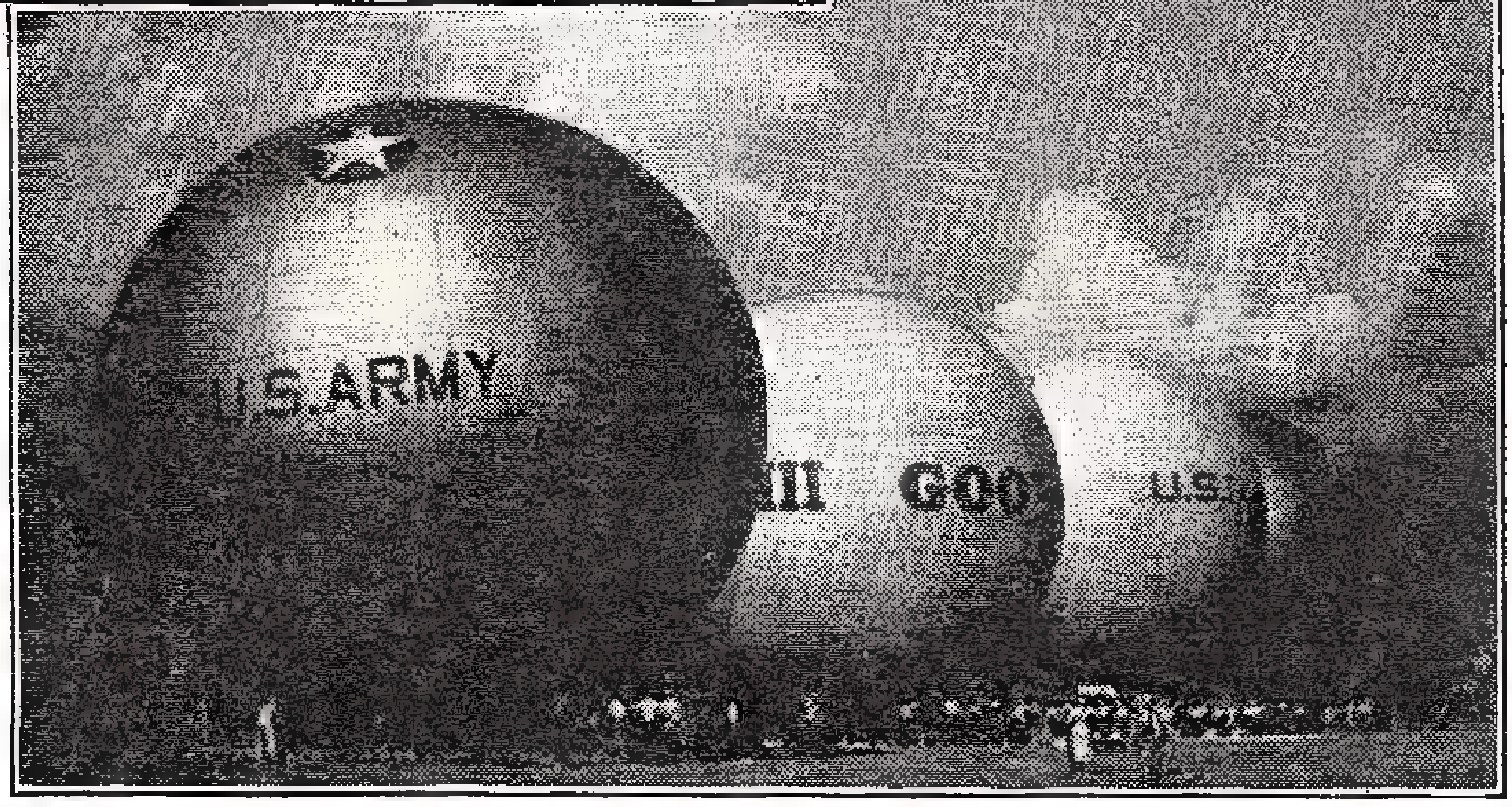
(Continued on page 124)

New Thrills With Infra-Red Photography

Photographing hot stoves and flatirons by their own illumination; making snapshots of scenes hidden by fog; and striking cloud effects await amateur who tries infra-red photography.



Above—A landscape taken on an infra-red plate. Note that green tree leaves appear white and that sky is darkened. The photograph suggests tonal effects of a moonlight scene.



At right—Unusual effects obtained on an infra-red plate of the start of an international balloon race. Note beautiful cloud reproduction and unusual contrasts. Clouds invisible to observers are clearly shown on infra-red photographs, since they reflect infra-red rays of sunlight.

Photo copyright by Walter E. Burton.

by Walter E. Burton

NEW sensitizing dyes have made it possible for manufacturers to offer amateur photographers improved infra-red sensitive films and plates that make invisible-light photography as simple as the ordinary kind. The only additional equipment you need for using such plates or films is a suitable red filter, costing a few cents.

Sensitive Plates Available

One plate manufacturer offers three kinds of infra-red sensitive plates in the popular sizes and at moderate prices. The one of most interest to the amateur is the Type I-R plate, a newcomer. It is recommended for use when photographing landscapes, for recording views ordinarily obscured by atmospheric haze, for photographing documents to detect alterations or forgeries, and for photographing hot irons, stoves and such things by their own heat rays, heat being a form of infra-red light. When making pictures of distant landscapes or similar objects in bright sunlight, exposures as short as 1/25 second at lens stop f:4.5 can be given, using, of course, a suitable red filter.

Two other plates not as well suited to amateur use as the Type I-R, but nevertheless useful at times, are the I-P and I-K types. Type I-P is suggested for making total-darkness pictures. Photographs of landscapes and distant scenes can be made on the I-K plates at a shutter speed of 1/5 to 1/2 second at stop f:4.5, with a Wratten A, No. 25 filter.

Owners of miniature cameras employing motion picture film can obtain 35-millimeter negative material that is sensitive to infra-red light.

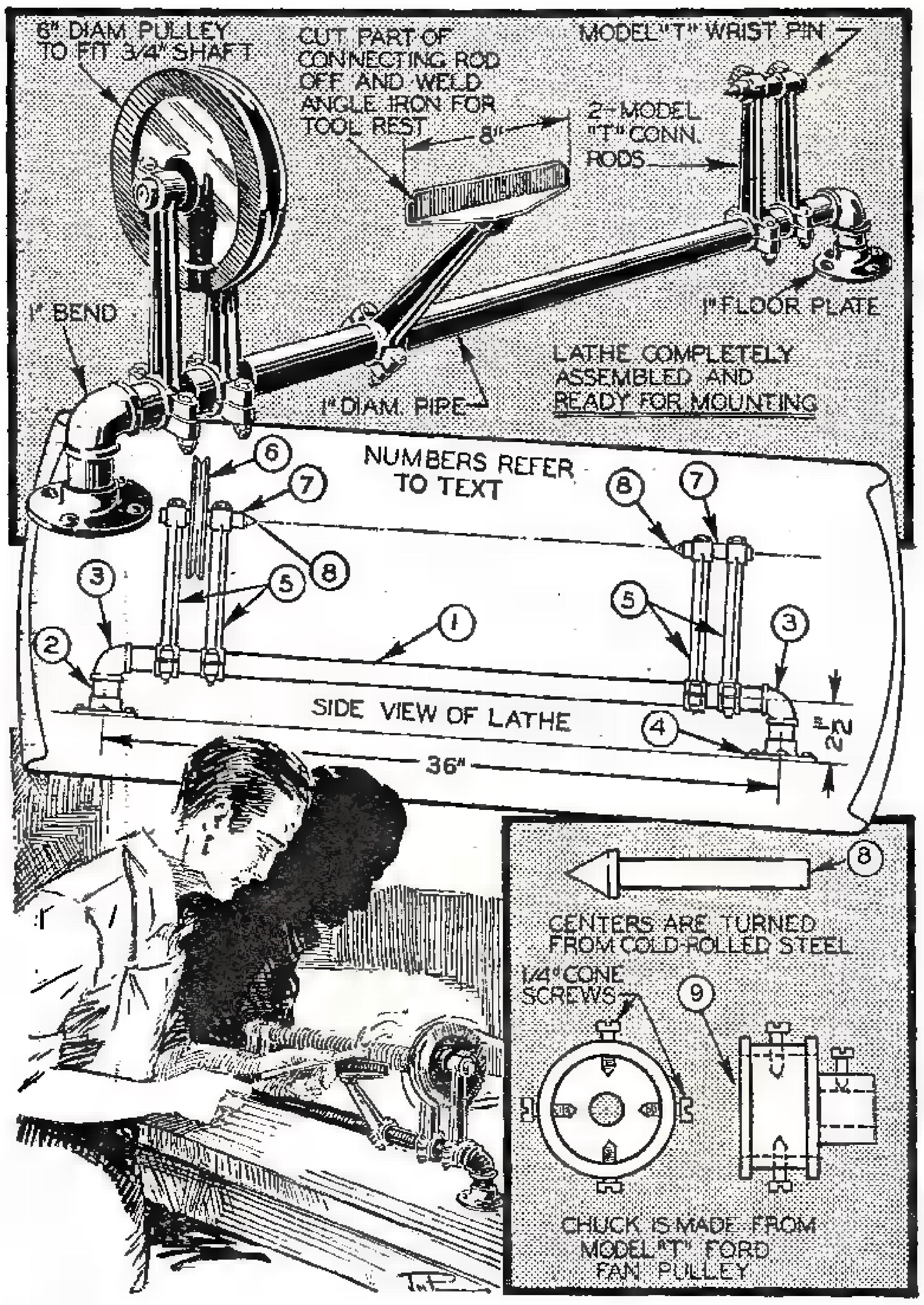
Best Color Filter

The best filter for all-around use with infra-red emulsions is the Wratten A, No. 25, or one having similar characteristics. It is the type employed for infra-red snapshots with the Type I-R plates. It passes considerable visible red light, as well as the invisible infra-red. The No. 87 Wratten filter, which transmits no visible light, is used only with the Type I-P plate for total-darkness work.

Some of the unusual effects are obtained by infra-red light. In landscape work, the blue sky records dark or black. Clouds,

(Continued on page 124)

Sturdy Bench Lathe Made From Old Connecting Rods


6" DIAM. PULLEY TO FIT 3/4" SHAFT
CUT PART OF CONNECTING ROD OFF AND WELD ANGLE IRON FOR TOOL REST
8"
MODEL "T" WRIST PIN
2-MODEL "T" CONN. RODS
1" BEND
1" FLOOR PLATE
LATHE COMPLETELY ASSEMBLED AND READY FOR MOUNTING
1" DIAM. PIPE
NUMBERS REFER TO TEXT
①
②
③
④
⑤
⑥
⑦
⑧
SIDE VIEW OF LATHE
36"
2½"
CENTERS ARE TURNED FROM COLD-ROLLED STEEL
1/4" CONE SCREWS
⑨
CHUCK IS MADE FROM MODEL "T" FORD FAN PULLEY

Old auto parts are used to make this bench lathe and chuck.

A REALLY good looking bench lathe can be made in a few hours at practically no cost, if a few old Ford parts and pipe fittings are to be had.

No. 1 on the drawing is a 36" length of 1" pipe, forming the lathe bed. Nos. 2, 3, and 4 are pipe fittings. No. 5 indicates four Ford T connecting rods with the babbitt removed, used as headstock and tailstock.

The V-type pulley, No. 6, is drilled for a ¾" shaft. The spindles, No. 7, are made from Ford wrist pins, and the centers, No. 8, are turned from cold-rolled steel shafting. Make these a sliding fit for the wrist pins.

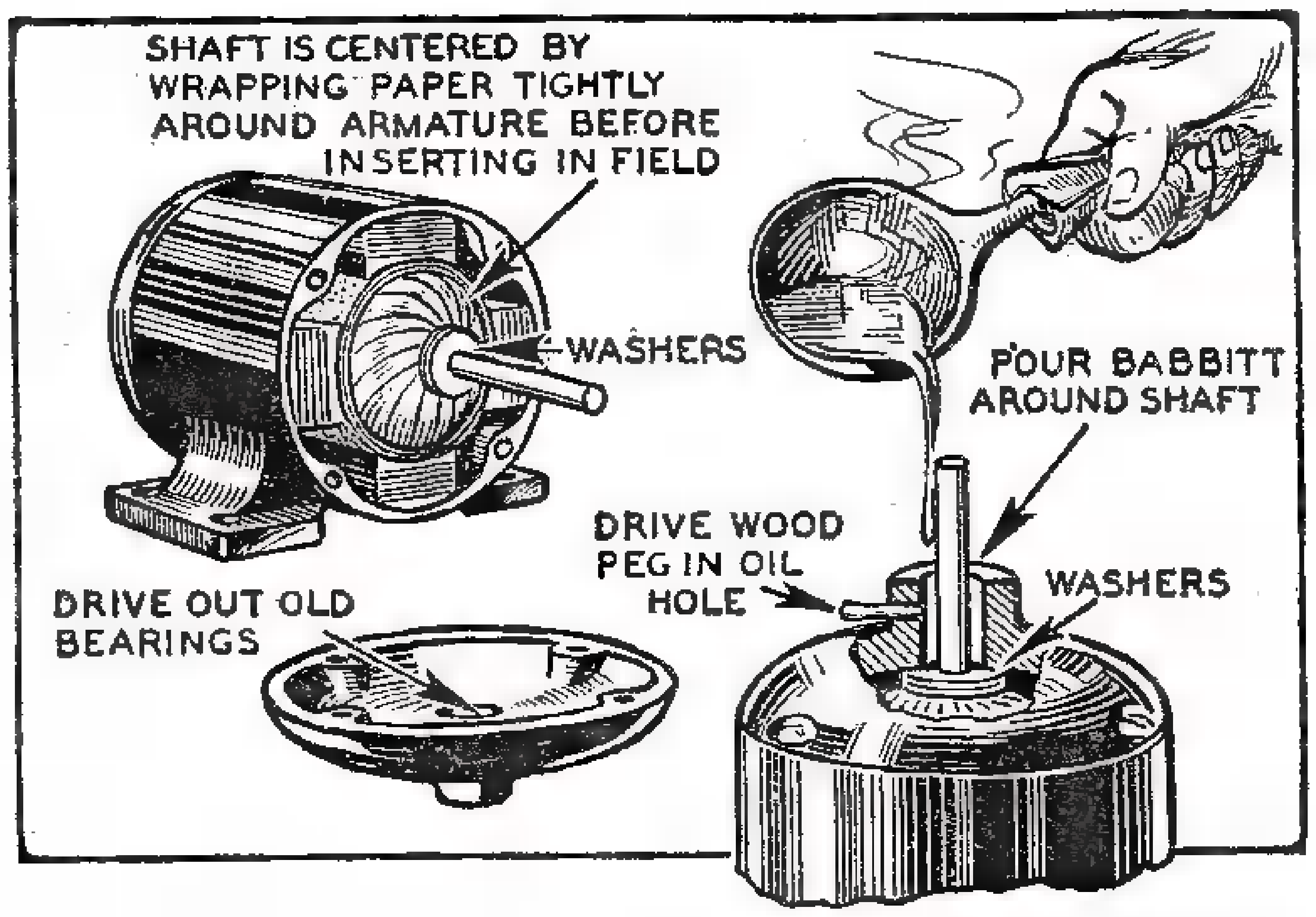
The chuck, No. 9, is made by reaming a fan pulley to a snug fit for the head stock spindle. Four ¼" holes are drilled around the face of the pulley and threaded for 1" machine bolts.

For a longer tool rest use a ¾" length of shafting through the wrist pin holes of two connecting rods. Use a file as cutting tool when turning metal on this lathe.

Replacing Small Motor Bearings

BEARINGS on electric fan motors and other small motors can be replaced at little cost when they become noisy and worn.

Remove the motor end plates, and drive out the old bearings. Wrap paper tightly around the armature so that it is accurately centered between the field poles. Place enough washers on the armature shaft at each end so that when the end caps are replaced there will be no end play. Tighten the end caps, turn motor in vertical position, and pour molten babbitt around the shaft for each bearing in turn. The babbitt bearings will be absolutely accurate.


SHAFT IS CENTERED BY WRAPPING PAPER TIGHTLY AROUND ARMATURE BEFORE INSERTING IN FIELD
WASHERS
POUR BABBITT AROUND SHAFT
DRIVE WOOD PEG IN OIL HOLE
WASHERS
DRIVE OUT OLD BEARINGS

New babbitt bearings are easily made for small motors.

New Uses for Old Bottles

A. M. Watt, ingenious Hollywood glass man, makes his living by converting old bottles into decorative beverage sets. Bottle tops are cut off, and bases decorated with bands.

EMPTY bottles that have outlived their original use can be converted into many useful and decorative objects.

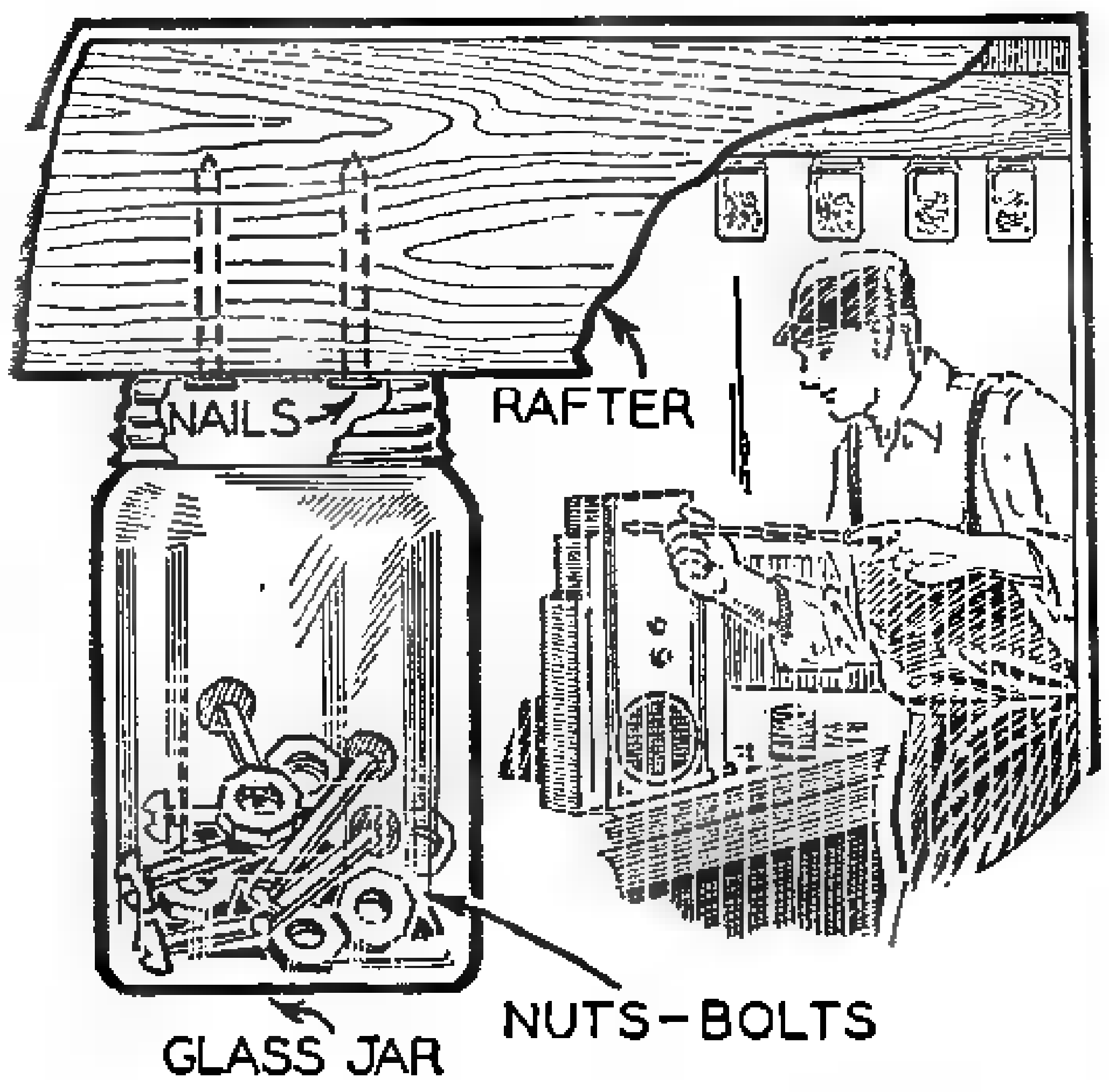
Ginger ale bottles, with their stems cut off, make fine, substantial beverage sets. Colored medicine bottles can be filed off for tricky flower bowls.

Smart wine glasses are made by cutting off the necks of bottles and screwing them upside down into metal bases.

For more decorative work engraving equipment is needed. Smart monograms can be cut in clear glass or frosted surfaces, and silver or gold bands added.

Thick bottles are cut off by first heating with a loop of red hot wire, then dropping in cold water. The glass cracks neatly along the line traced by the wire.

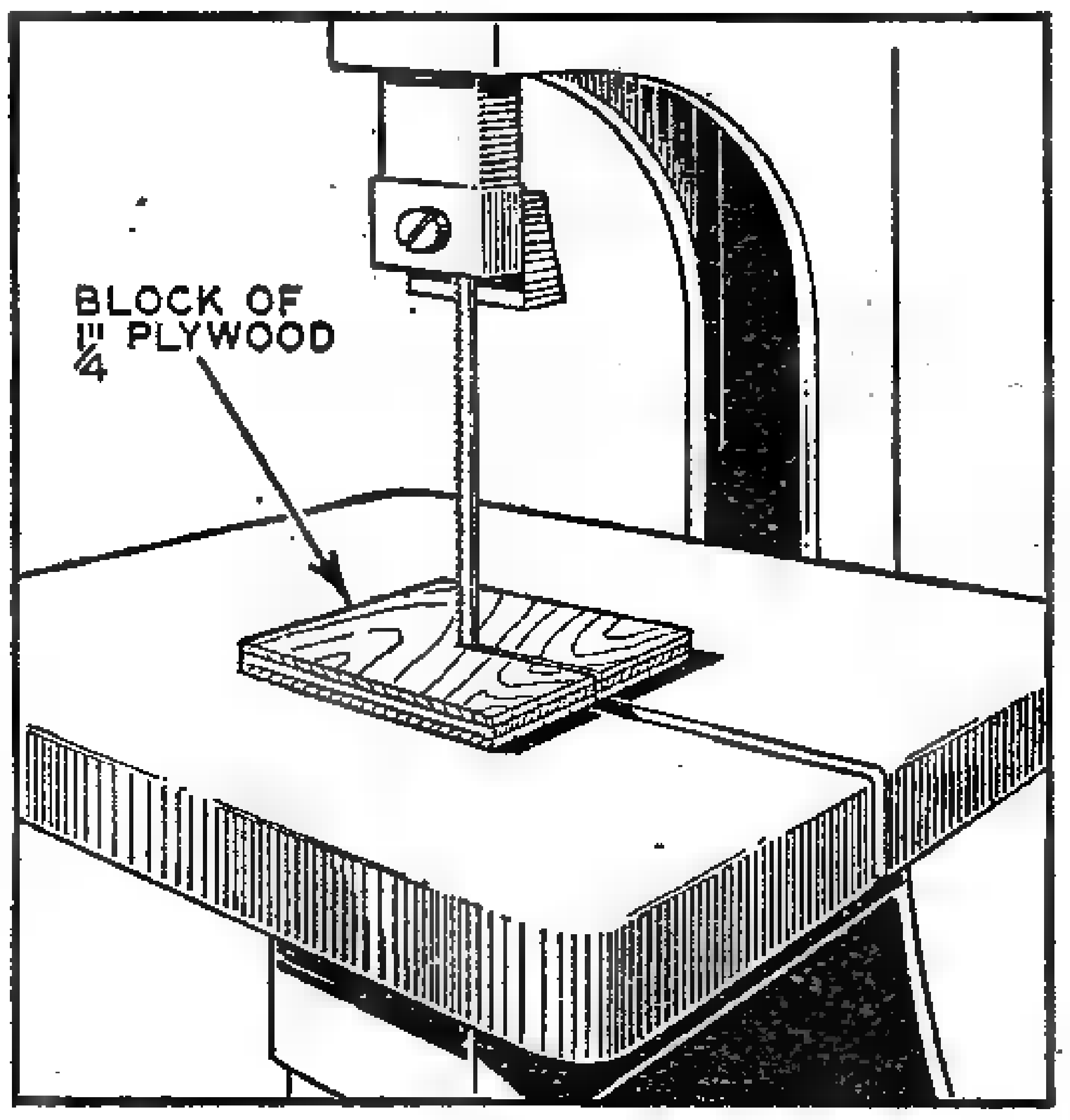
Time-Saving Workshop Handikinks


NAILS
RAFTER
GLASS JAR
NUTS-BOLTS

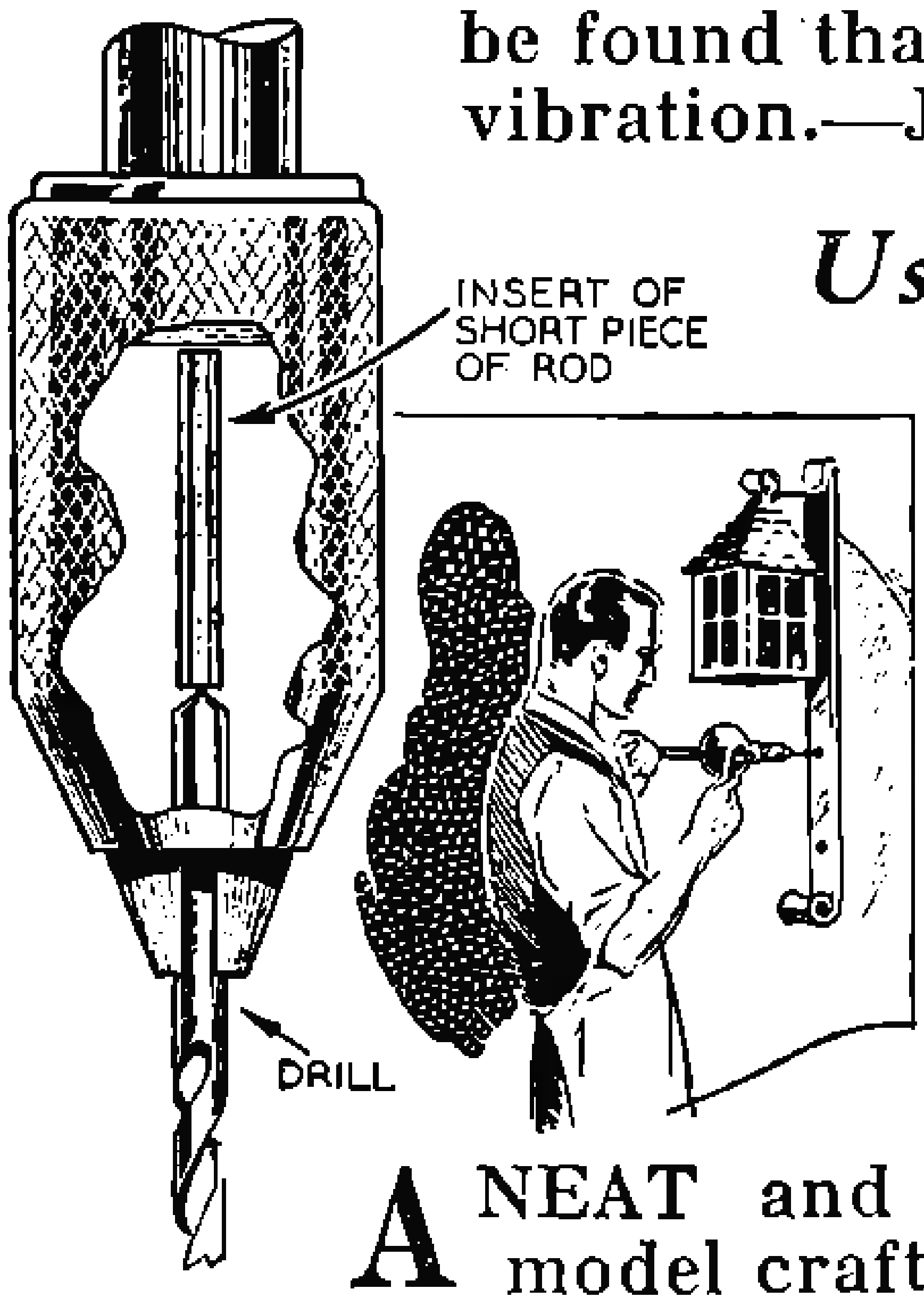
Glass Jars Save Shelf Space on Workbench

SMALL glass jars have been found very handy as containers for bolts, nuts, washers, and other small workshop parts, but often shelf space for the jars is limited. Simply fasten the screw-tops of these jars to the bottom of some shelf or joist near the workbench, using two small nails or wood screws. Each container is thus readily accessible by a mere "twist of the wrist," but out of the way in space otherwise wasted.—R. Eyrich.

Cutting Cardboard on the Bandsaw


BLOCK OF ¼" PLYWOOD

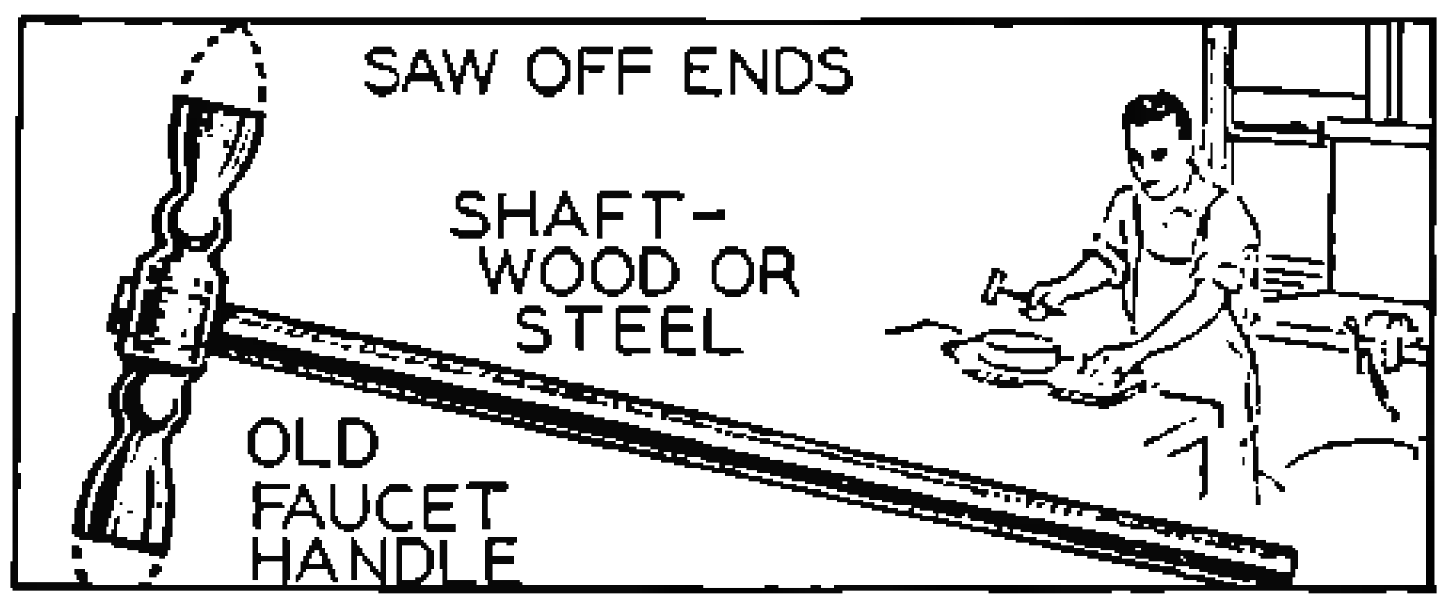
WHEN making paper or cardboard models of boats, it is often difficult to cut out the irregularly-shaped pieces with a razor blade or scissors. A bandsaw works well with heavier cardboard, but for thin pieces the blade vibrates too much, leaving a ragged edge. Take a piece of ¼" plywood, and cut it part way through on the bandsaw. Using this plywood as a saw table, it will be found that the narrow slit stops all blade vibration.—J. B. Jones.


INSERT OF SHORT PIECE OF ROD
DRILL

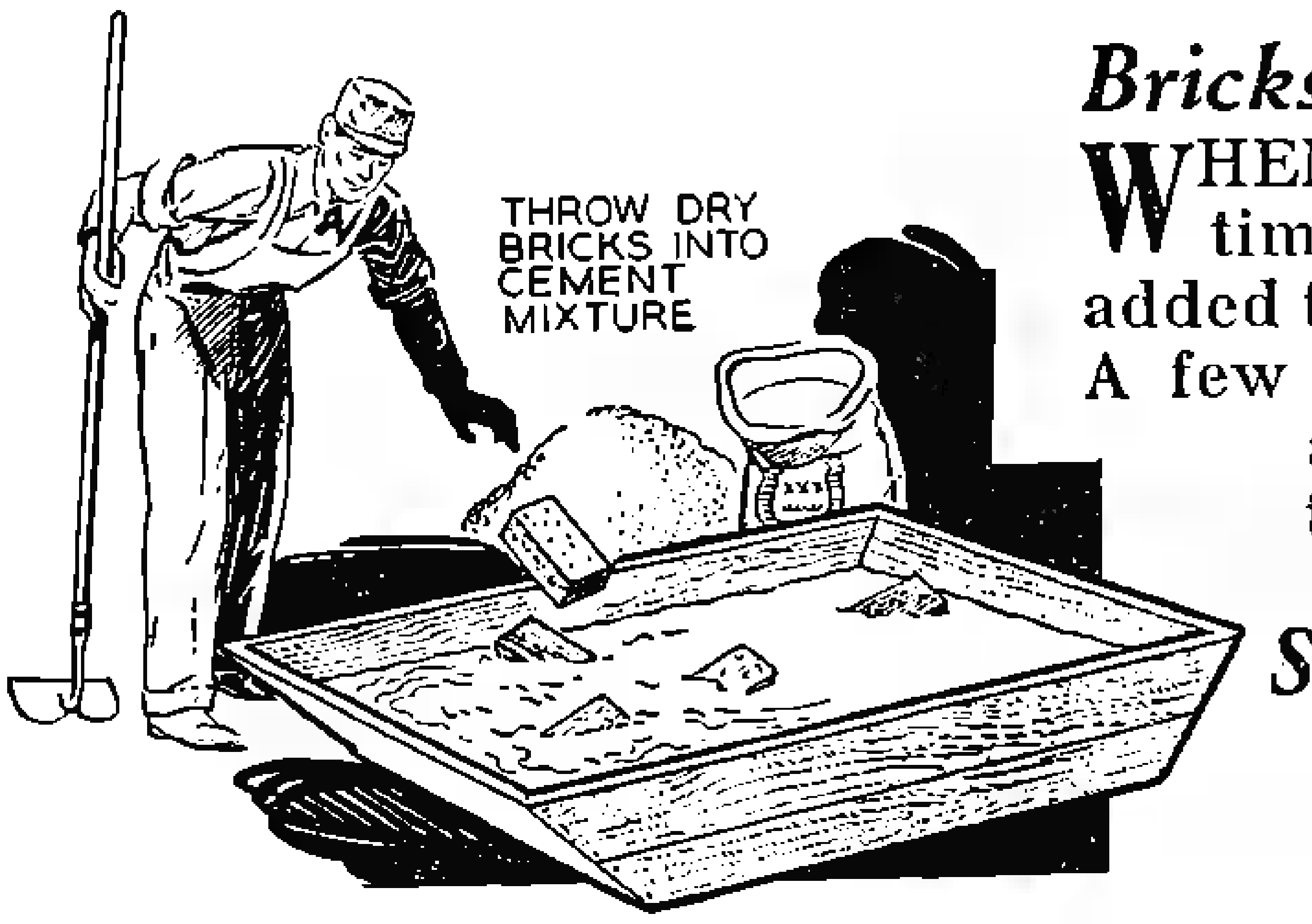
Using Short Drills in Chuck

SHORT drills sometimes slip upwards in a drill-press chuck, especially when the chuck is a bit worn or too much pressure is used when drilling some heavy material. This can be stopped by cutting a short piece of rod, of a diameter slightly less than that of the drill being used, and slipping it into the chuck before inserting the drill. By this method shortened drills can be made to give many more hours of service.—John E. Serafin.

Useful Little Hammer Made From Water Faucet


SAW OFF ENDS
SHAFT-WOOD OR STEEL
OLD FAUCET HANDLE

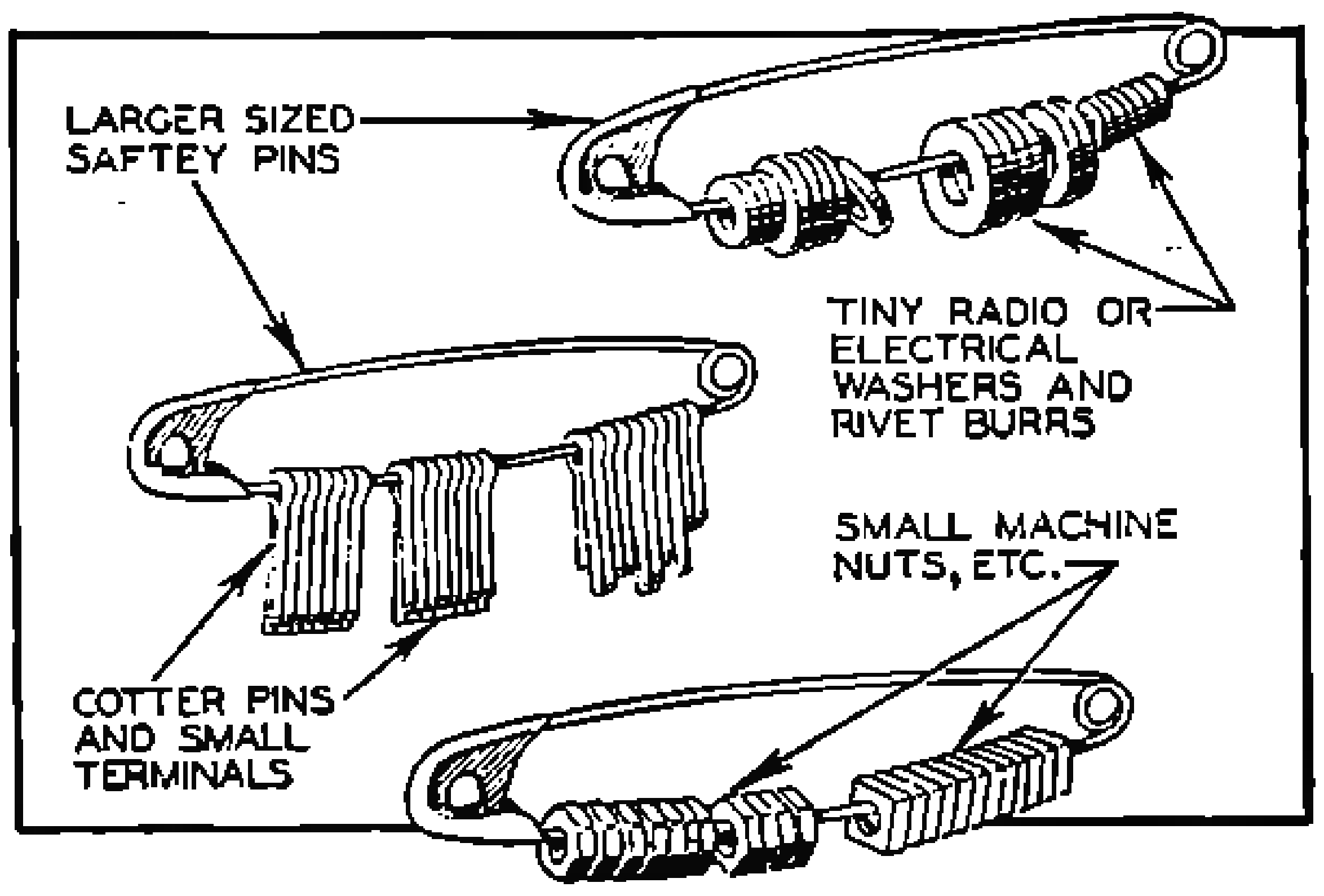
A NEAT and useful little hammer for the model craftsman is easily made from a discarded water faucet handle. File or grind the rounded ends flat. Fasten a handle 7" long and ½" in diameter tightly in the screw-hole. Although the metal is rather soft, it will drive pins and brads nicely.—Chas. McFarlin.


THROW DRY BRICKS INTO CEMENT MIXTURE

Bricks Will Absorb Excess Water in Cement

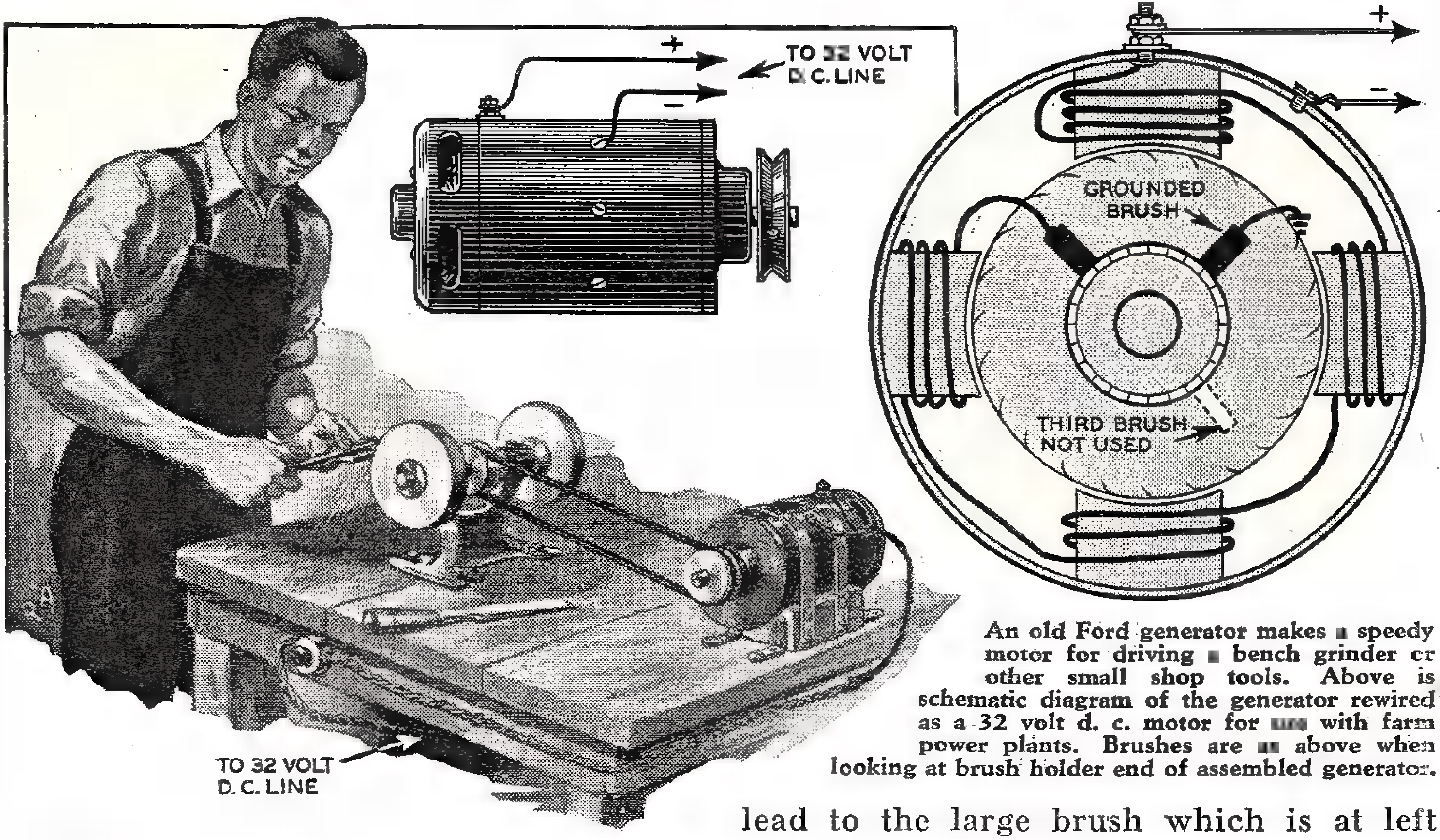
WHEN mixing concrete, too much water is sometimes poured in. More sand or cement may be added to offset this, but in many cases it is not desirable. A few ordinary bricks, thrown into the mortar, will absorb enough water in a few minutes to make the concrete workable.—W. Mattson.

Safety Pins Hold Washers


LARGER SIZED SAFTEY PINS
TINY RADIO OR ELECTRICAL WASHERS AND RIVET BURRS
SMALL MACHINE NUTS, ETC.
COTTER PINS AND SMALL TERMINALS

MECHANICS, electricians, and radio fans have all experienced the difficulty of trying to find small cotter pins or nuts in boxes containing larger parts. Common safety pins are the solution for this problem. Use a separate pin for each part, and thread on the tiny parts as shown in drawing.—John M. Polivka.

New Uses for Old Auto GENERATORS



An old Ford generator makes a speedy motor for driving a bench grinder or other small shop tools. Above is schematic diagram of the generator rewired as a 32 volt d. c. motor for use with farm power plants. Brushes are as above when looking at brush holder end of assembled generator.

ONLY a few changes in wiring are necessary to convert a Model T Ford generator into a powerful 32 volt d. c. motor for farm power plants. The motor will drive a bench grinder or small shop tools at around 1,700 r.p.m., will draw not over 10 amperes at starting, and will use very little power when running light.

First rotate the entire brush holder to a position where the large brushes are equidistant from the top of the generator.

Connect the field coil lead closest to the top to the insulated terminal, and the other lead to the large brush which is at left after the brush holder is rotated.

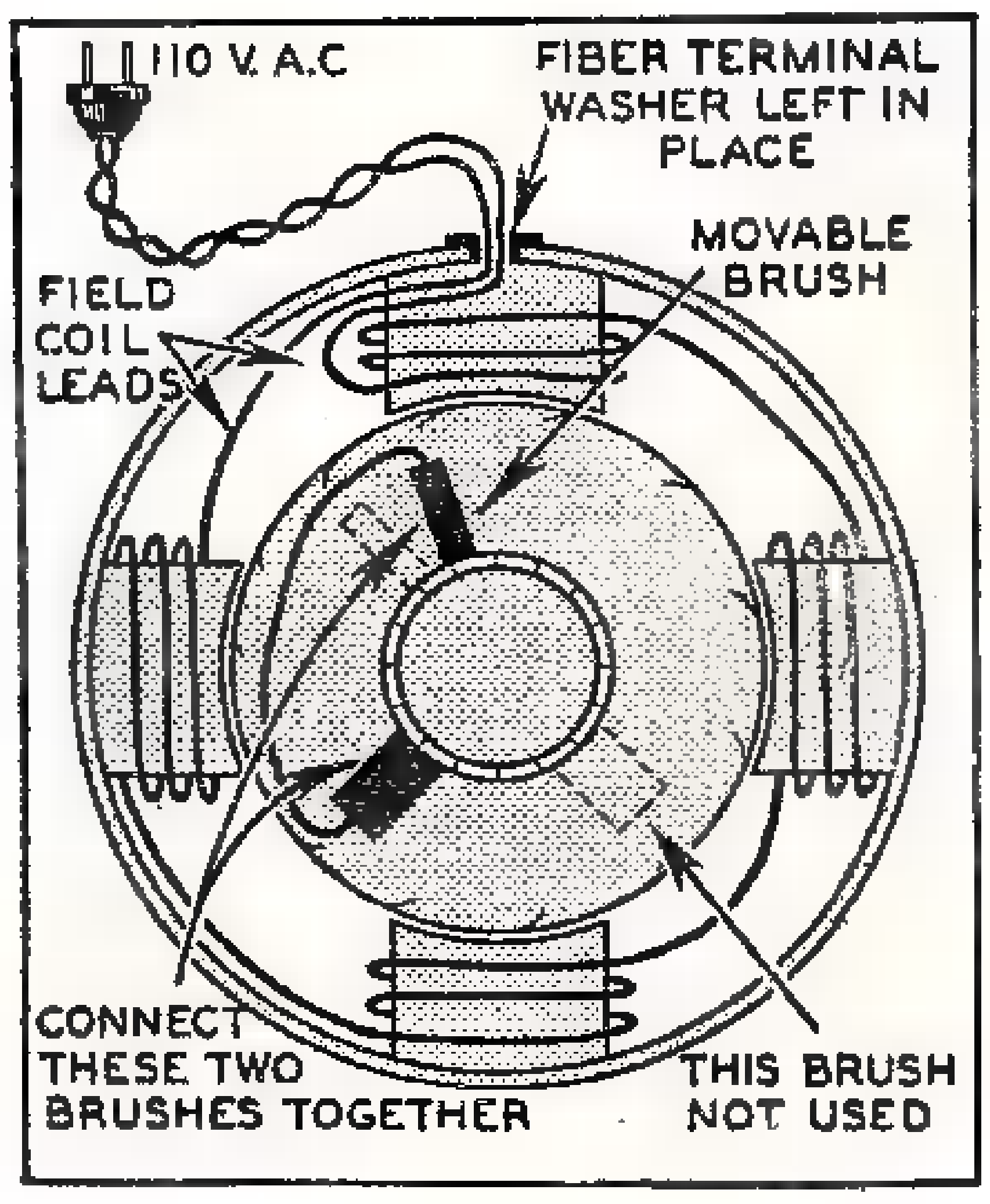
The other large brush is already grounded to the frame, so nothing need be done with it. The movable brush is not used, and can be removed.

Replace the generator end assembly. Connect terminal at top of generator to plus side of 32 volt d. c. lines, and fasten the negative side of line to the generator frame.

Start the motor, loosen the four screws of the brush holder, and rotate the holder a few degrees each way until the setting for greatest power and speed is obtained.

Making a Speedy 110-volt A.C. Motor From Old Ford T Generator

A POWERFUL alternating current induction motor can be had for absolutely no cost, if you have an old Model T Ford generator at hand. The motor will run at around 1,500 r.p.m., more than fast enough to drive a bench grinder or light shop tools. It doesn't draw more than 300 watts even when fully loaded.


110 V. A.C
FIBER TERMINAL WASHER LEFT IN PLACE
MOVABLE BRUSH
FIELD COIL LEADS
CONNECT THESE TWO BRUSHES TOGETHER
THIS BRUSH NOT USED

Remove the end cap containing brushes, and disconnect all leads. Remove the wire running to the terminal post, and the terminal screw.

Run the two field coil leads out through the thick fiber washer in the terminal post, enlarging the washer hole if necessary. Connect these leads to an extension cord and plug.

Connect the movable brush to the large brush which is on the left side when you are facing the brush end of the assembled generator. The other large brush can be removed. Rotate the movable brush until best speed is obtained.

$5 for Your Generator Idea

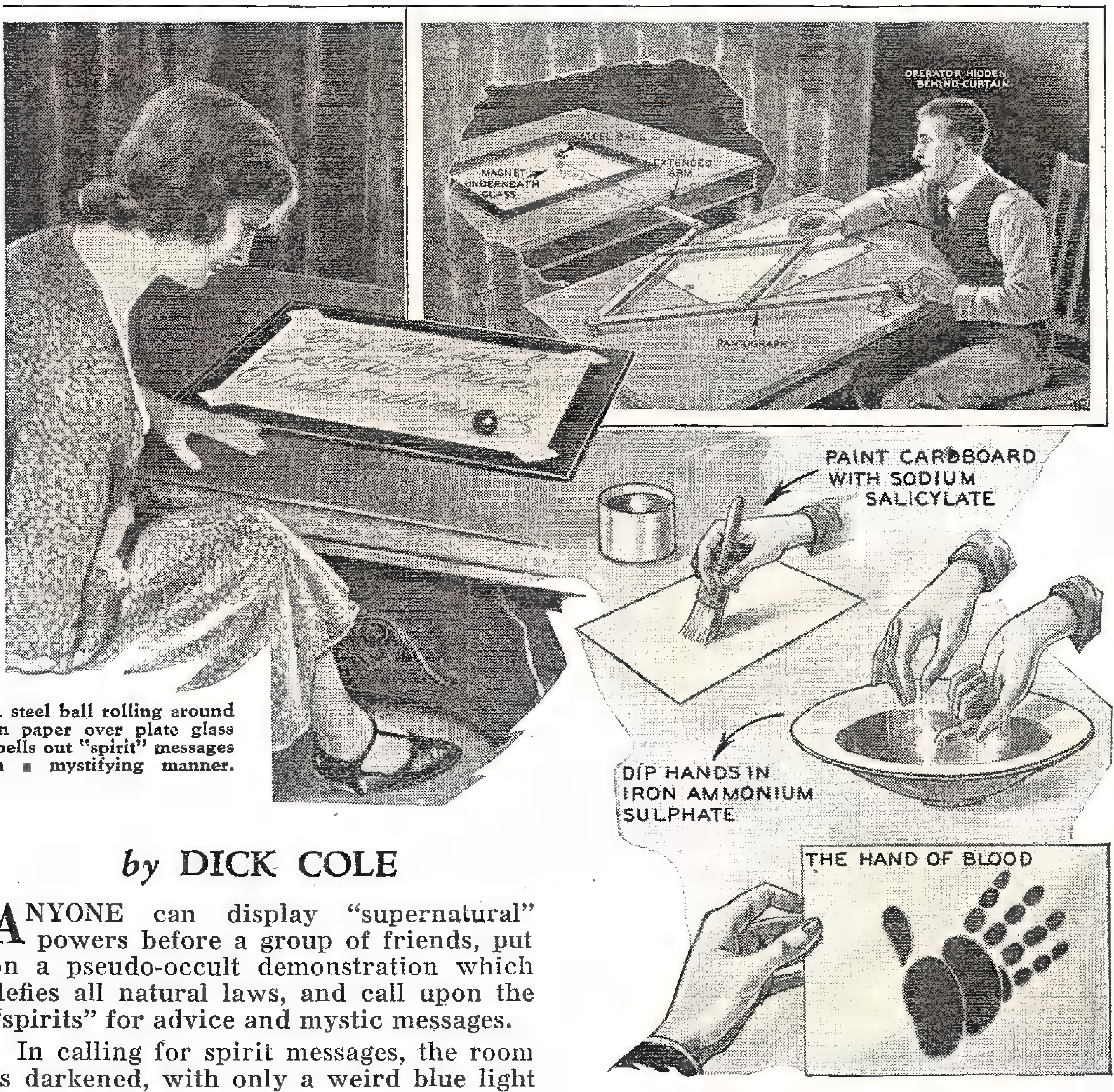
MANY new uses can be found for the old automobile starter and generator motors which are now so easy to get. Perhaps you have your own pet conversion which might be of interest to other M-M readers.

MODERN MECHANIX AND INVENTIONS editors will pay $5 for each accepted story telling of a new use for any common type of car starter or generator. Be sure to send clear diagrams and give approximate results obtainable from your converted equipment.

Suggested uses are as electric outboard motors, wind driven battery charging generators, midget car electric motors, lathe headstocks, bench grinders, and higher voltage motors and generators.

Address contributions to Auto Dept., Modern Mechanix Publishing Co., 529 So. 7th St., Minneapolis, Minnesota. Manuscripts which cannot be used will be returned if a stamped envelope is enclosed.

Entertain Friends with These


OPERATOR HIDDEN BEHIND CURTAIN
STEEL BALL
MAGNET UNDERNEATH GLASS
EXTENDED ARM
PANTOGRAPH
PAINT CARDBOARD WITH SODIUM SALICYLATE
DIP HANDS IN IRON AMMONIUM SULPHATE
THE HAND OF BLOOD

A steel ball rolling around on paper over plate glass spells out "spirit" messages in a mystifying manner.

Performer washes hands in seemingly clear water, presses one hand on ordinary white cardboard, and bloody red imprint of human hand is immediately formed on cardboard.

by DICK COLE

ANYONE can display "supernatural" powers before a group of friends, put on a pseudo-occult demonstration which defies all natural laws, and call upon the "spirits" for advice and mystic messages.

In calling for spirit messages, the room is darkened, with only a weird blue light to cast grotesque shadows.

Trick Is Simple

In the center of the table is a sheet of paper over a square of plate glass, with a black steel ball resting on one corner.

Monotonously chanting mystic unintelligible words, the "medium" demands a message of the spirits, in answer to a query from someone in the audience.

As the spectators watch the ball, it quivers—moves—leaves a black trail in its wake! The trail forms letters—words—a message on the smooth glass!

The secret is this. First of all, the apparently solid steel ball is hollow. It is coated with lamp-black, which forms the trail of black on the glass.

Beneath the table is a powerful permanent or electro-magnet, supported by a pantograph arm which extends back through a hole in the curtain to the pantograph assembly on another table.

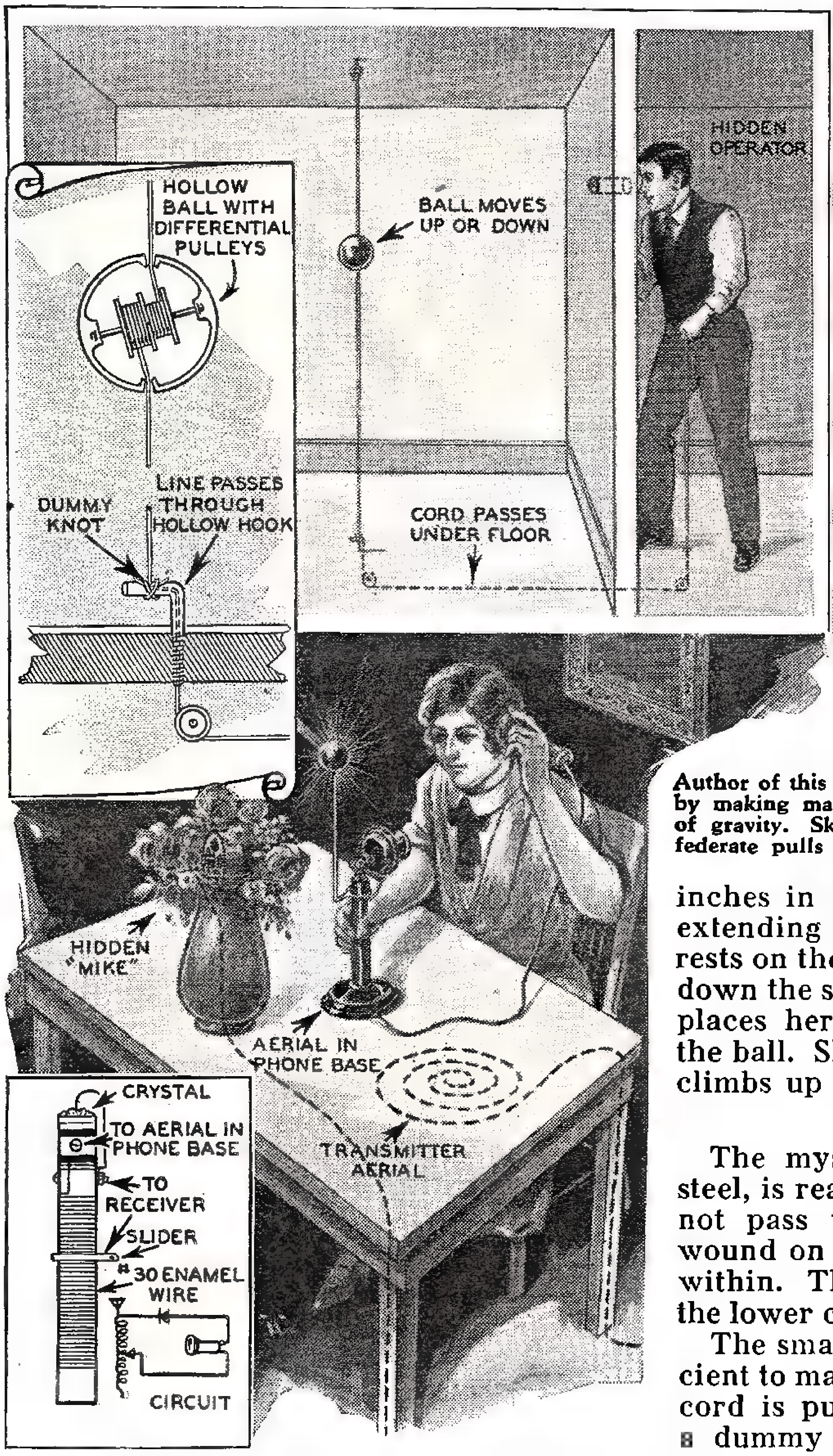
A confederate writes out the messages with the tracing point of the pantograph, and the moving magnet pulls the hollow steel ball around on the glass.

Ordinary wood laths can be used for the pantograph arms, the distances being easily determined for the desired size of writing after a few trial settings of the arms.

A popular East Indian Yogi trick is the "Hand of Blood." To prepare for this, paint or spray a piece of cardboard or cloth with a solution of sodium salicylate. Prepare a solution of iron-ammonium-sulphate.

Show the cardboard to the audience to

Pseudo-Occult Magic Tricks


HOLLOW BALL WITH DIFFERENTIAL PULLEYS
BALL MOVES UP OR DOWN
HIDDEN OPERATOR
DUMMY KNOT
LINE PASSES THROUGH HOLLOW HOOK
CORD PASSES UNDER FLOOR
HIDDEN "MIKE"
AERIAL IN PHONE BASE
TRANSMITTER AERIAL
CRYSTAL
TO AERIAL IN PHONE BASE
TO RECEIVER
SLIDER
#30 ENAMEL WIRE
CIRCUIT

Author of this article demonstrates "ectoplastic magnetism" by making massive steel ball climb up string in defiance of gravity. Sketches at left show how it is done. Confederate pulls gently on lower cord to make ball climb.

Wireless telephone for conversing with "spirits" is not at all mystifying to a radio fan. Crystal set, connected to receiver, is concealed in base of phone, using circuit shown above.

prove it has not been colored beforehand. Clean your hands of dirt by washing in the clear sulphate solution, and press one hand carefully on the cardboard.

The chemical on the hand, coming in contact with the treated cardboard, produces a deep red stain—an impression of a bloody human hand!

"Ectoplastic magnetism" can be demonstrated in a slightly darkened room. A shiny, chromium-plated ball about eight inches in diameter is threaded on a cord extending from ceiling to floor. The ball rests on the floor, but is free to slide up and down the string. The "medium" stoops and places her hands about six inches above the ball. Slowly raising her hands, the ball climbs up the cord in defiance of gravity.

Ball Is Hollow

The mystic ball, seemingly of massive steel, is really a metal shell. The cord does not pass through the ball; each end is wound on a drum turning on a cross-shaft within. The drums are of different sizes, the lower cord winding on the larger drum.

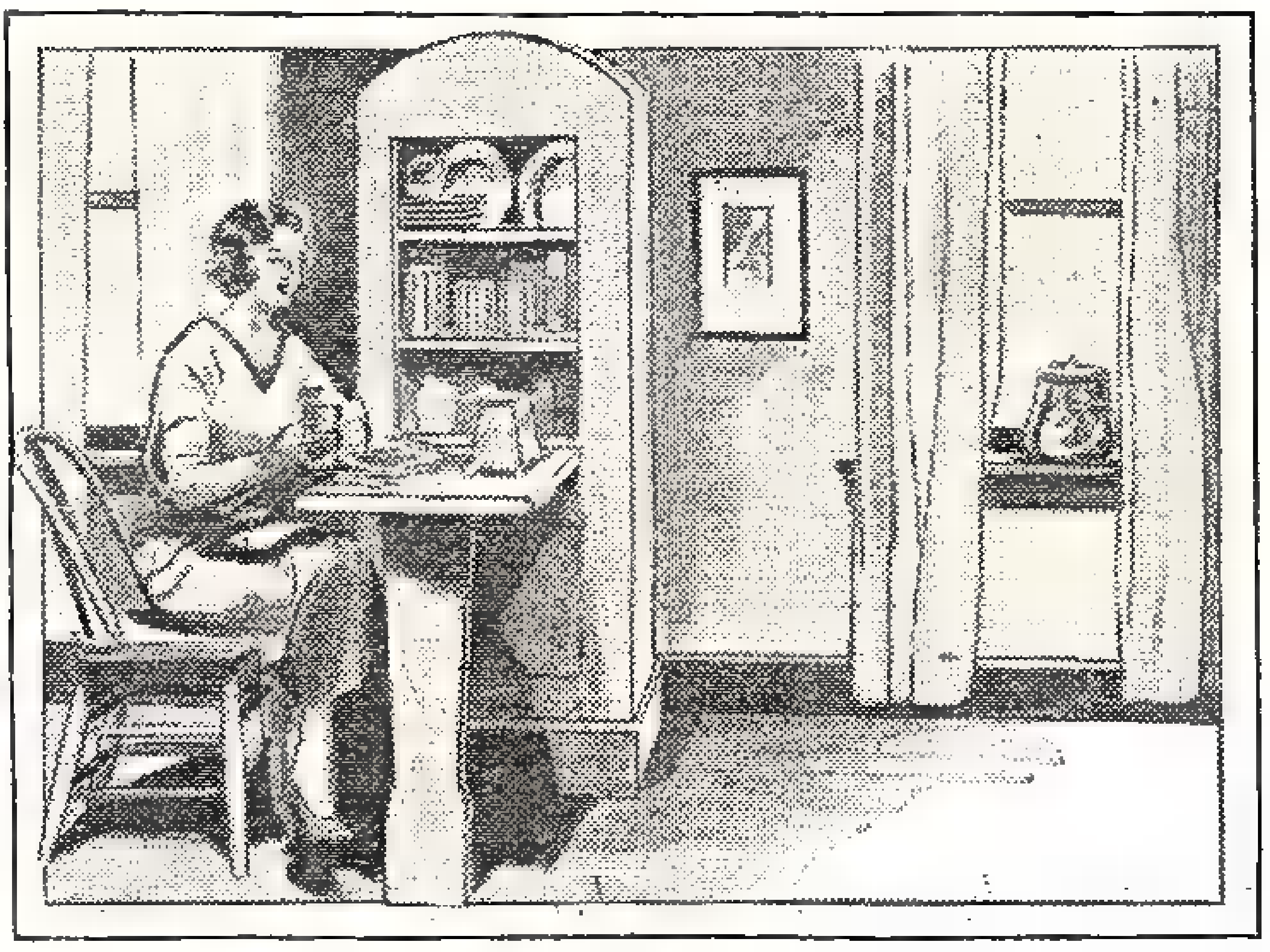
The small leverage obtained here is sufficient to make the ball climb when the lower cord is pulled. This cord passes through a dummy knot on the hollow screw-eye, down through the floor to a remote point where a peeping confederate moves the ball in unison with the operator's hands.

"Spirit messages" can be received over an ordinary telephone entirely disconnected from the line. A miniature crystal set, built into the body of the wireless telephone, is connected to the receiver.

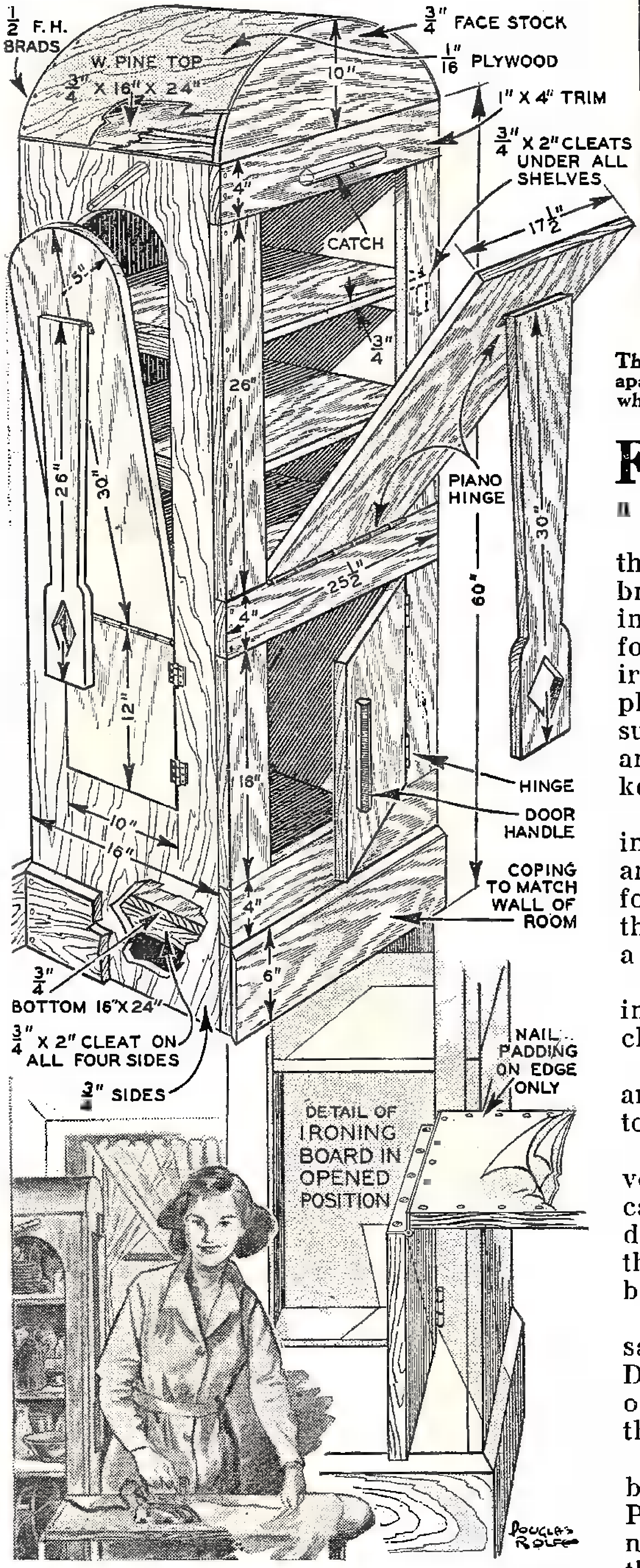
The transmitter is located in another part of the house, and the sending aerial run up through the floor to the table.

A microphone concealed in a vase of flowers picks up the words spoken into the telephone and brings them to the "spirit."

BREAKFAST CABINET *for the Cottage*



This modernistically designed cabinet looks well in any apartment. There's room for three on the built-in table, which folds up to completely hide food and dishes.



1/2 F.H. BRADS
W. PINE TOP 3/4" X 16" X 24"
3/4" FACE STOCK
1/16" PLYWOOD
10"
1" X 4" TRIM
3/4" X 2" CLEATS UNDER ALL SHELVES
4"
CATCH
17 1/2"
5"
3/4"
26"
26"
30"
PIANO HINGE
30"
25 1/2"
60"
4"
12"
18"
HINGE
DOOR HANDLE
10"
16"
COPING TO MATCH WALL OF ROOM
4"
6"
3/4" BOTTOM 16"X24"
3/4" X 2" CLEAT ON ALL FOUR SIDES
3/4" SIDES
NAIL PADDING ON EDGE ONLY
DETAIL OF IRONING BOARD IN OPENED POSITION
DOUGLAS ROLFE

The ironing board is built right into the side of this handy kitchen cabinet. It is hinged to a small door, so that it swings out into the room where there is plenty of light. A hinged leg automatically drops into place as the board is let down, to support outer end. Padding is nailed to top only.

FOR cottages and apartments, this breakfast cabinet, no bigger than the case of a grandfather's clock, is ideal.

Closed, one would never suspect that all the china, tableware, and pans for making breakfasts and lunches could be contained in such a small cabinet. There are shelves for a toaster, chafing dish, electric grill, iron, and all the tableware and pans, with plenty of room left for bread and other light supplies. Beneath is room for a dishpan and the bulkier necessities of light housekeeping.

A dining table and ironing board are so ingeniously built into the cabinet that they are hardly noticeable. The table, when folded, is a door which effectively conceals the breakfast dishes. In the open position a dining table for three is presented.

Lumber and hardware costs for this cabinet should not run over four dollars, since clear white pine is used throughout.

For the side boards two pieces ¾"x16"x5' are needed. Narrower boards may be glued together if the 16" widths are hard to get.

Select the side which will be most convenient for the ironing board, and lay out carefully the outlines of board and small door beneath, which are to be cut out of the side. Note that the bottom of the ironing board is 26" above the floor.

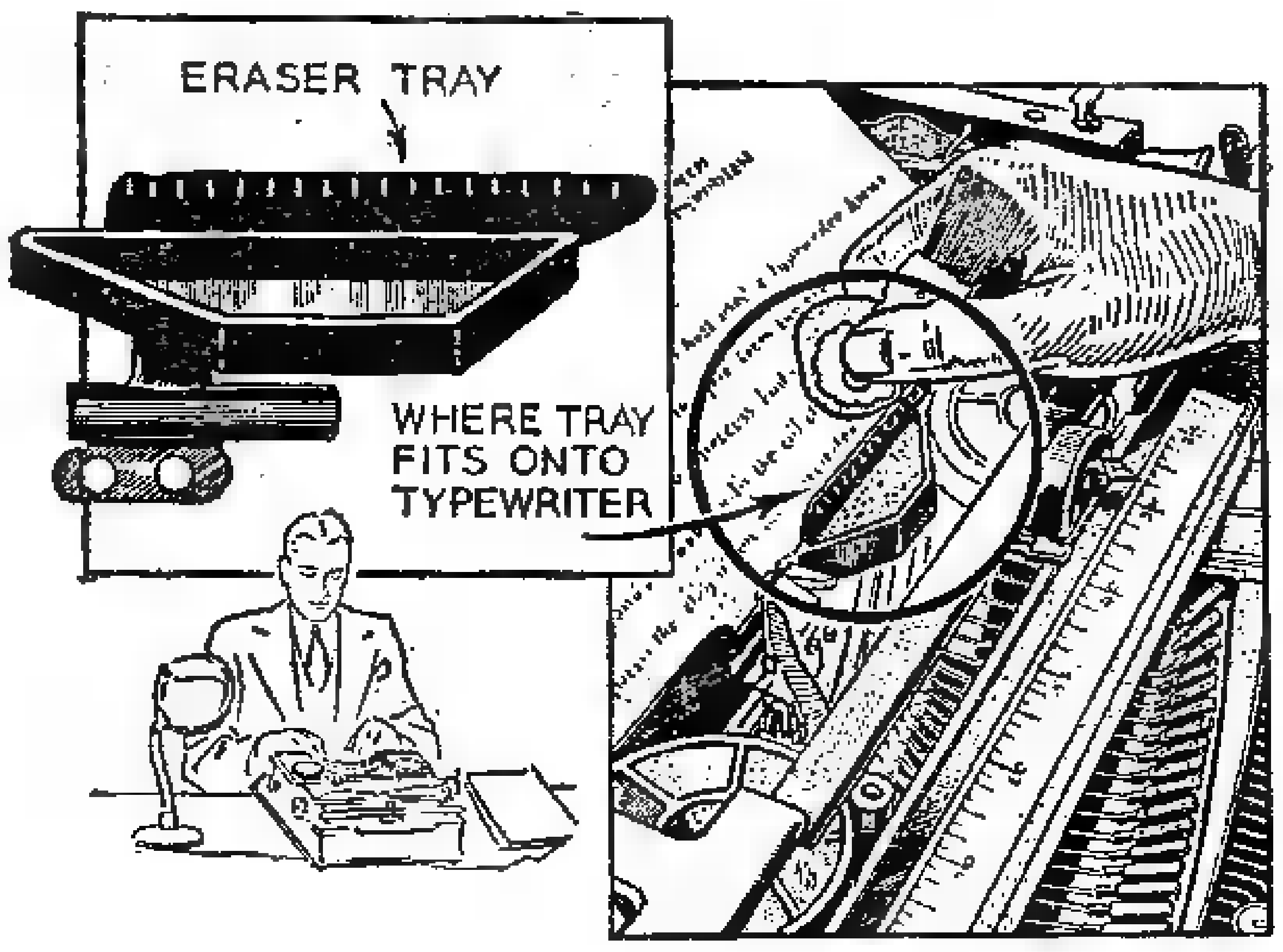
Saw out the board with a sharp coping saw, making as smooth a cut as possible. Do not sand the sawed edges; a coat of paint on the sawed edges will just about conceal the thin saw cut if care is used here.

Use a long brass hinge for the ironing board, and two small hinges for the door. Pad the ironing surface in the usual manner, tacking the material only to the top of the board.

Screw the top and bottom pieces, of ¾"x16"x24" pine, to the side boards. Use

(Continued on page 120)

Handy Ideas That Will Save Money

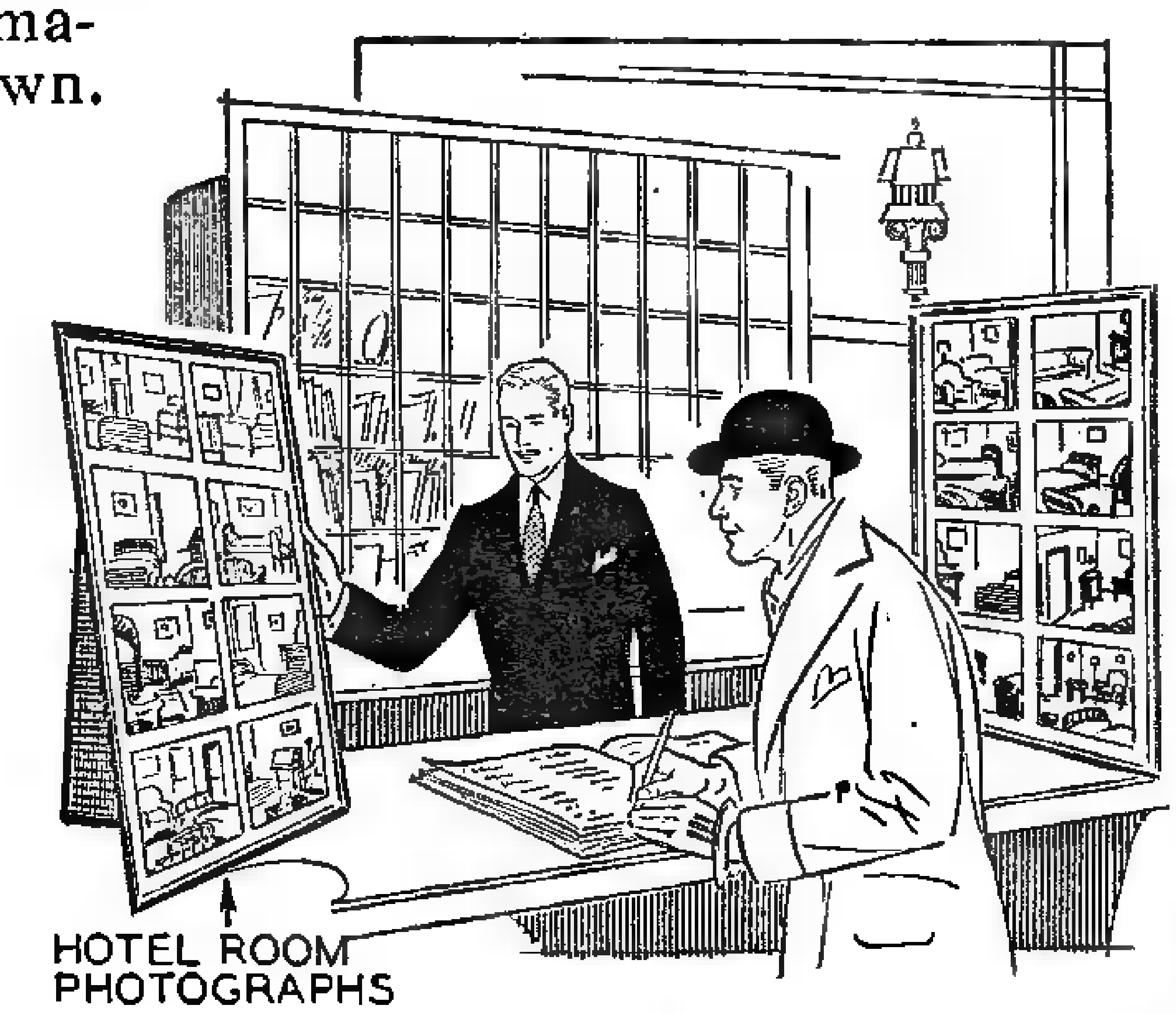

ERASER TRAY
WHERE TRAY FITS ONTO TYPEWRITER

Simple Typewriter Eraser Tray Catches Grit

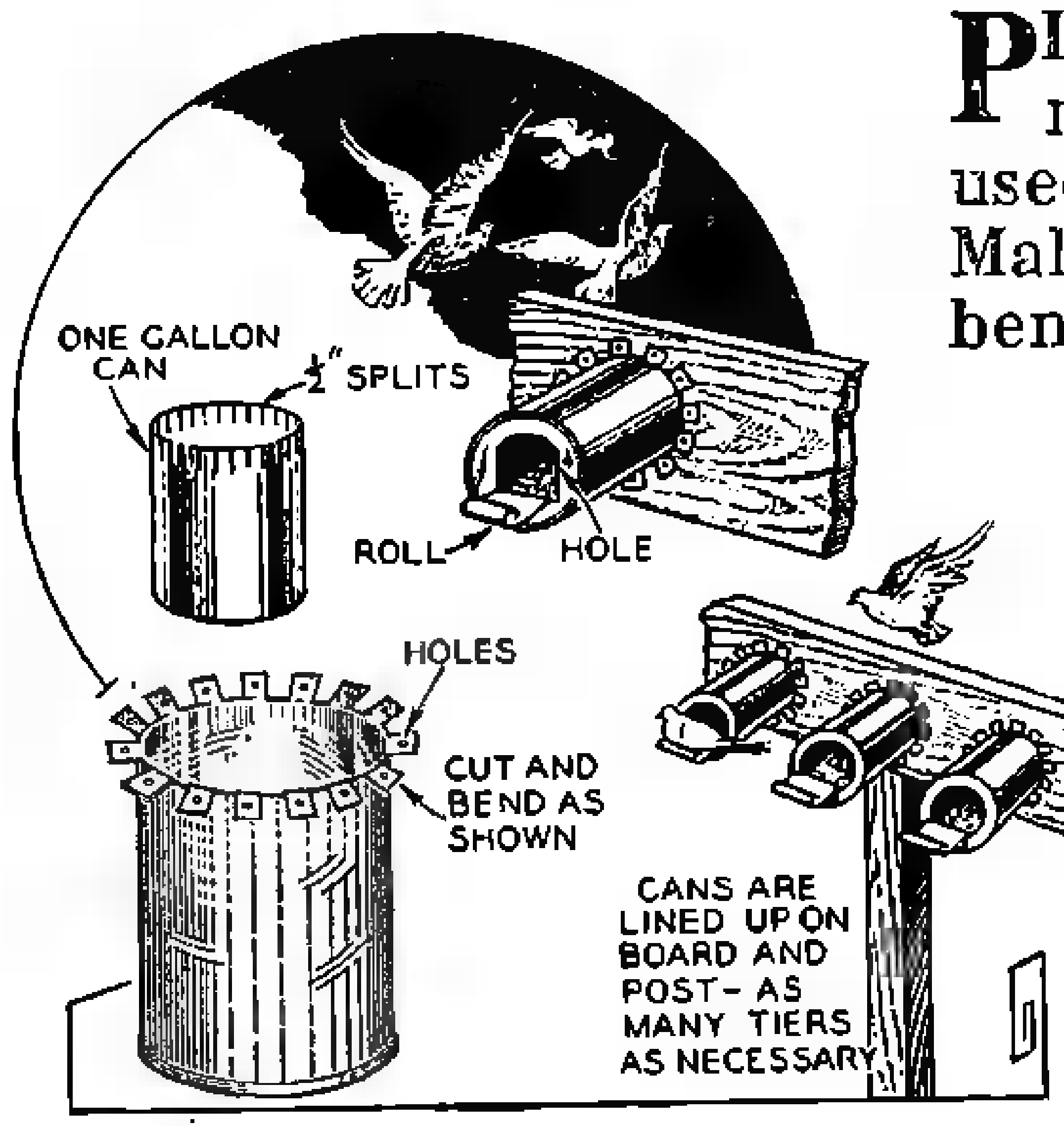
THE moving parts of a typewriter soon become gummed up if grit from the eraser is allowed to drop into the mechanism. A simple tray mounted in a position to catch this grit will save many repair bills and greatly prolong the life of the machine. Pieces of thin sheet brass are easily cut and soldered into a tray 1½"x½"x¼" deep. The mounting should be placed on machine as shown.—J. E. Hogg.

Hotel Rooms Sold From Photographs

WHEN photographs of the different kinds of rooms available in a hotel are neatly displayed at the desk in the lobby, transient roomers will have no difficulty in choosing rooms. Visitors can see exactly what type of room they will get, and complaints will be greatly reduced. With a bit of attention to lighting, an amateur photographer should be able to secure very good room pictures with a medium sized camera. Prints can then be enlarged.—John B. Behrends.


HOTEL ROOM PHOTOGRAPHS

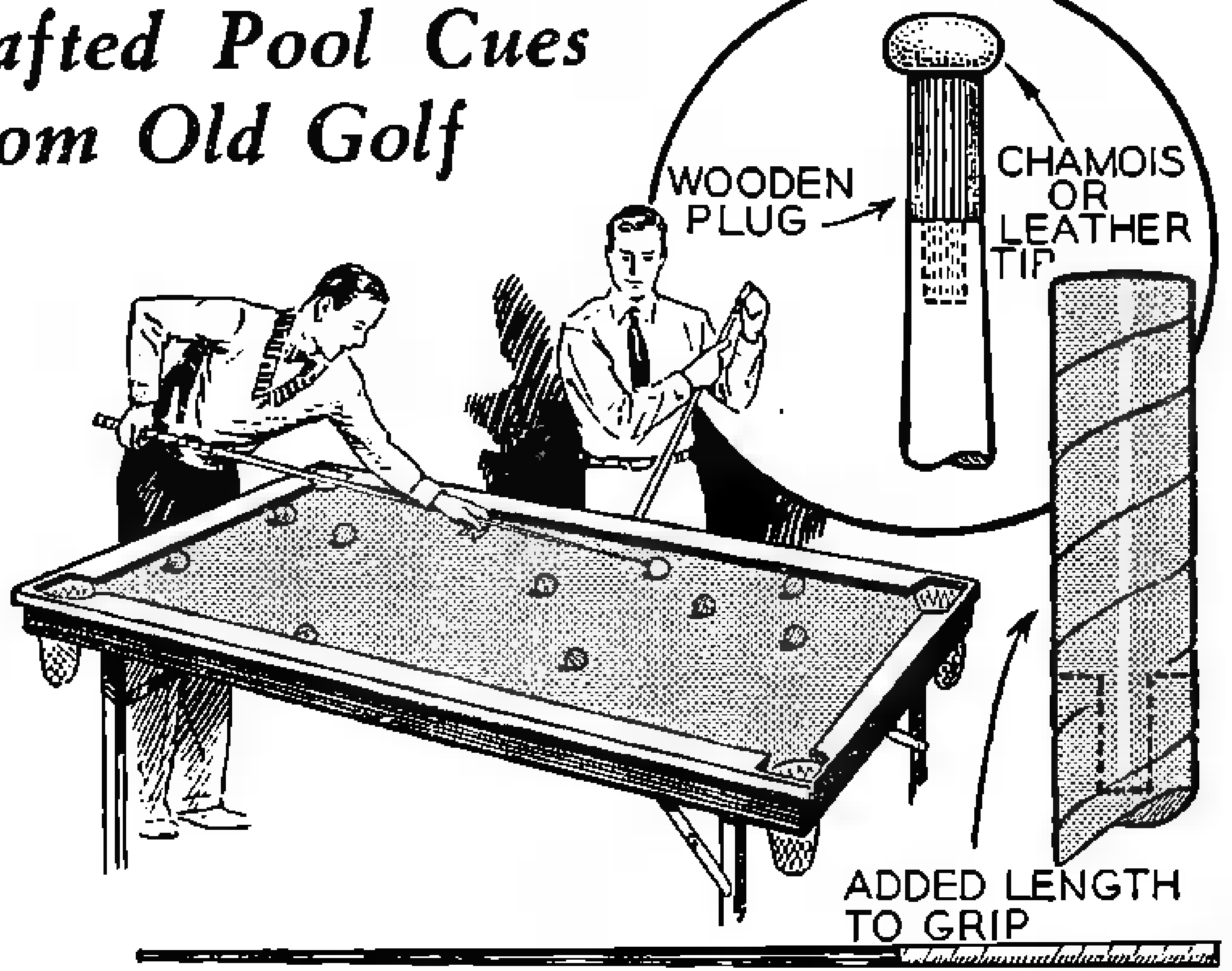
Gallon Tin Cans Make Pigeon Houses


ONE GALLON CAN
½" SPLITS
ROLL
HOLE
HOLES
CUT AND BEND AS SHOWN
CANS ARE LINED UP ON BOARD AND POST- AS MANY TIERS AS NECESSARY

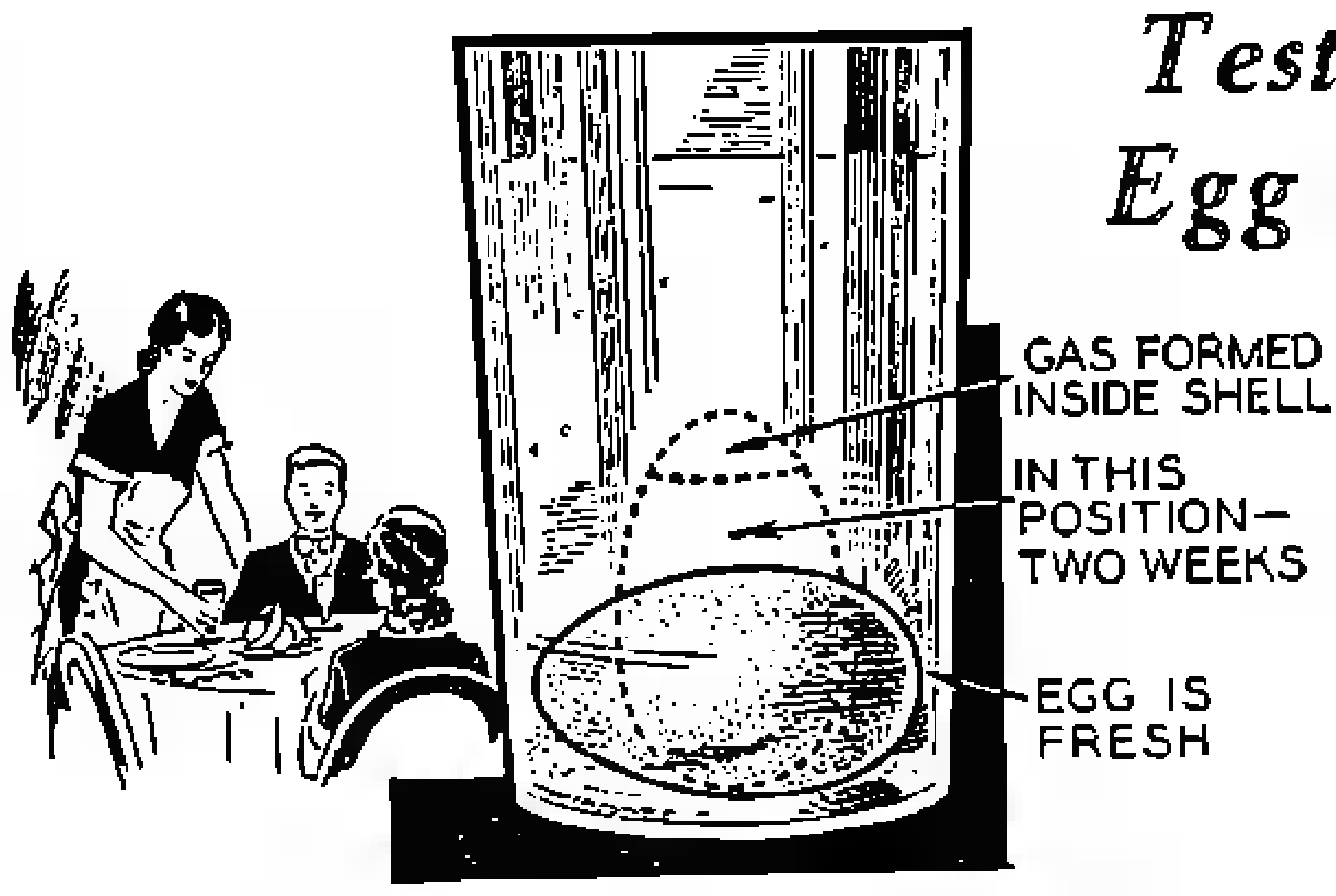
PIGEON houses can be built in any quantity at practically no cost if a number of one gallon tin cans, such as those used for canned fruits, vegetables, or honey, are available. Make slits ½ in. long around top of can about 1 in. apart, bend out, and punch small hole in each with nail. Nail cans on boards, or directly to building. Cut a circular hole in the bottom of each can, bending the tin down and rolling the end to make a smooth perch. File down any sharp edges. Eight or ten boards may be nailed to one post, giving space for at least 50 pigeons.—A. H. Waychoff.

Steel Shafted Pool Cues Made From Old Golf Clubs

VERY neat and practical cues may be made from the steel shafts of old golf clubs. File the slender end down evenly to fit into a small wooden plug. Leave a small beveled shoulder on the wood tip, so that several thicknesses of chamois skin or leather can be glued on. It is best to add about 10 inches to the length of the shaft, to give a cue about 50 in. long.—C. Bolstad.


WOODEN PLUG
CHAMOIS OR LEATHER TIP
ADDED LENGTH TO GRIP
STEEL SHAFT

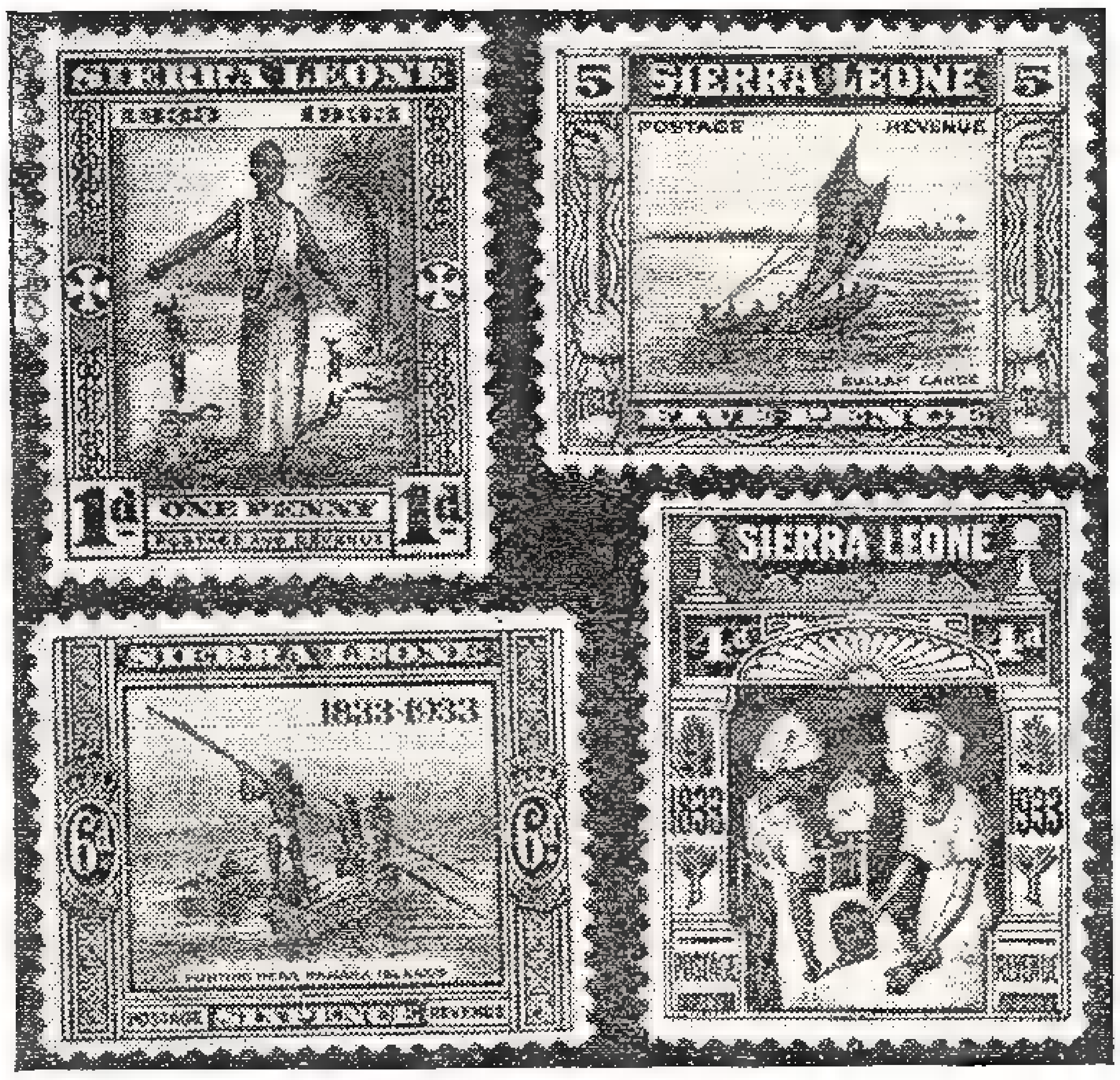
Testing Bad Egg in Water


GAS FORMED INSIDE SHELL
IN THIS POSITION—TWO WEEKS
EGG IS FRESH

A VERY simple yet positive method of testing eggs requires only a partly filled glass of water. Place one egg at a time in a very wide glass or cup partly filled with water. If the egg stands straight up it can generally be considered over two weeks old, but if it remains in a horizontal position it is fresh. Gas is formed in the air space at the end of eggs when they are old.—Mrs. R. F. Lambert.

WITH
The
COLLECTORS
40
Saunders

Beautiful Sierra Leone Stamps Show Liberation of Slaves


SIERRA LEONE
1833 1933
1d ONE PENNY 1d
5 SIERRA LEONE 5
POSTAGE REVENUE
BULLAM CANOE
FIVE PENCE
SIERRA LEONE
1833-1933
6d
SIXPENCE
SIERRA LEONE
4d
1833 1933

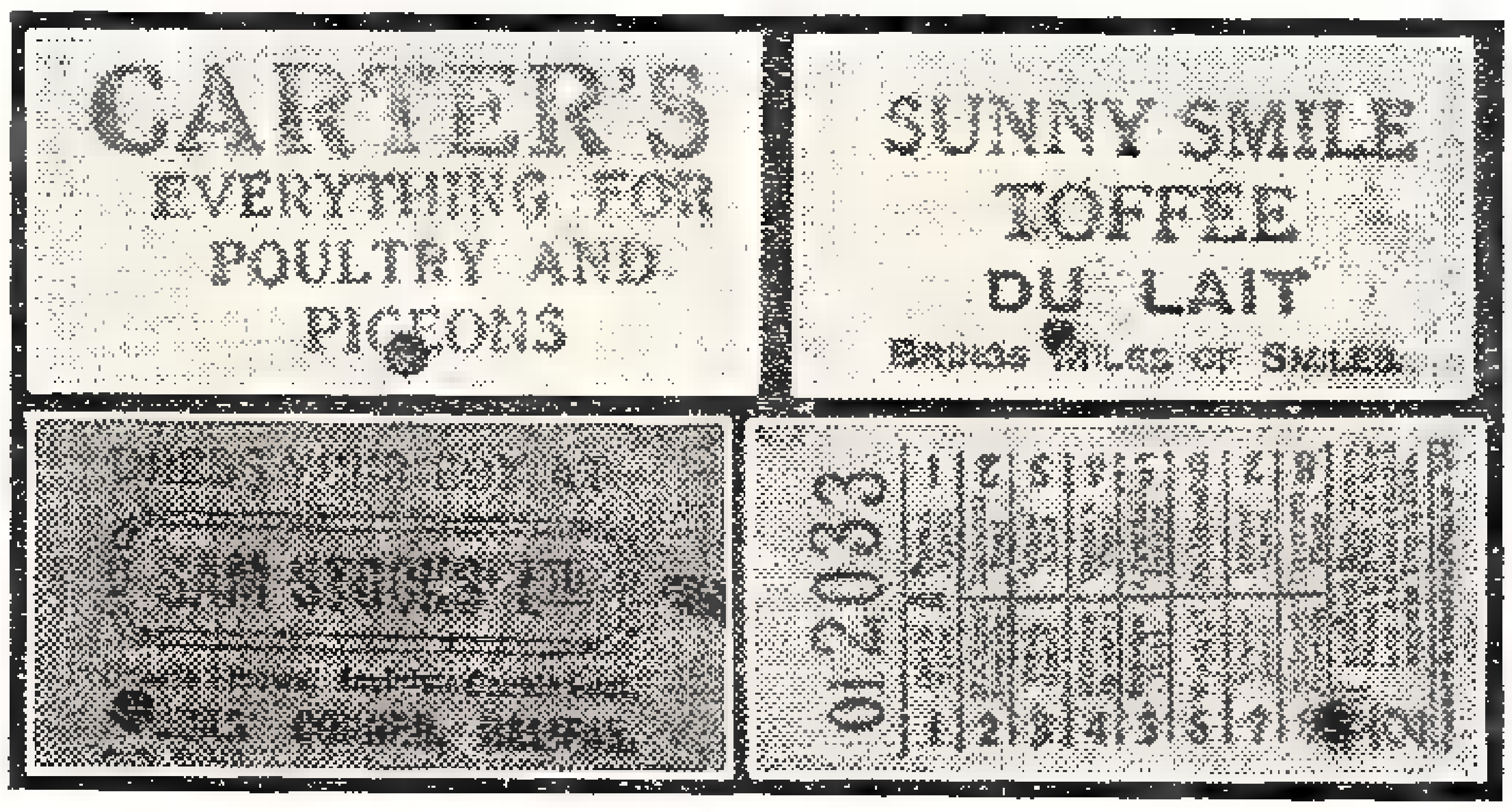
1d black and brown: slave on seashore being freed from chains; 5d red brown and green: Bullam canoe sailing with wind; 6d orange and black: natives spearing fish from punt near Banana Islands; 4d brown: nurses aid native.

SIERRA LEONE, mystical negro colony on the west coast of Africa, recently issued a beautifully engraved set of stamps marking the 100th anniversary of the death of William Wilberforce, famous English anti-slavery agitator, and recalling Britain's act of 1833 abolishing slavery in all British colonies.

Queer Ads on English Transfers

ADVERTISEMENTS listing everything from pigeon supplies to double seat trousers are to be found on the backs of English and Canadian tram tickets. It is customary in these countries to print only the different transfer points, thus leaving considerable ad space to be sold.

Queer ads, gay colors, interesting slogans, all go to make transfer collecting one of the most interesting of hobbies.

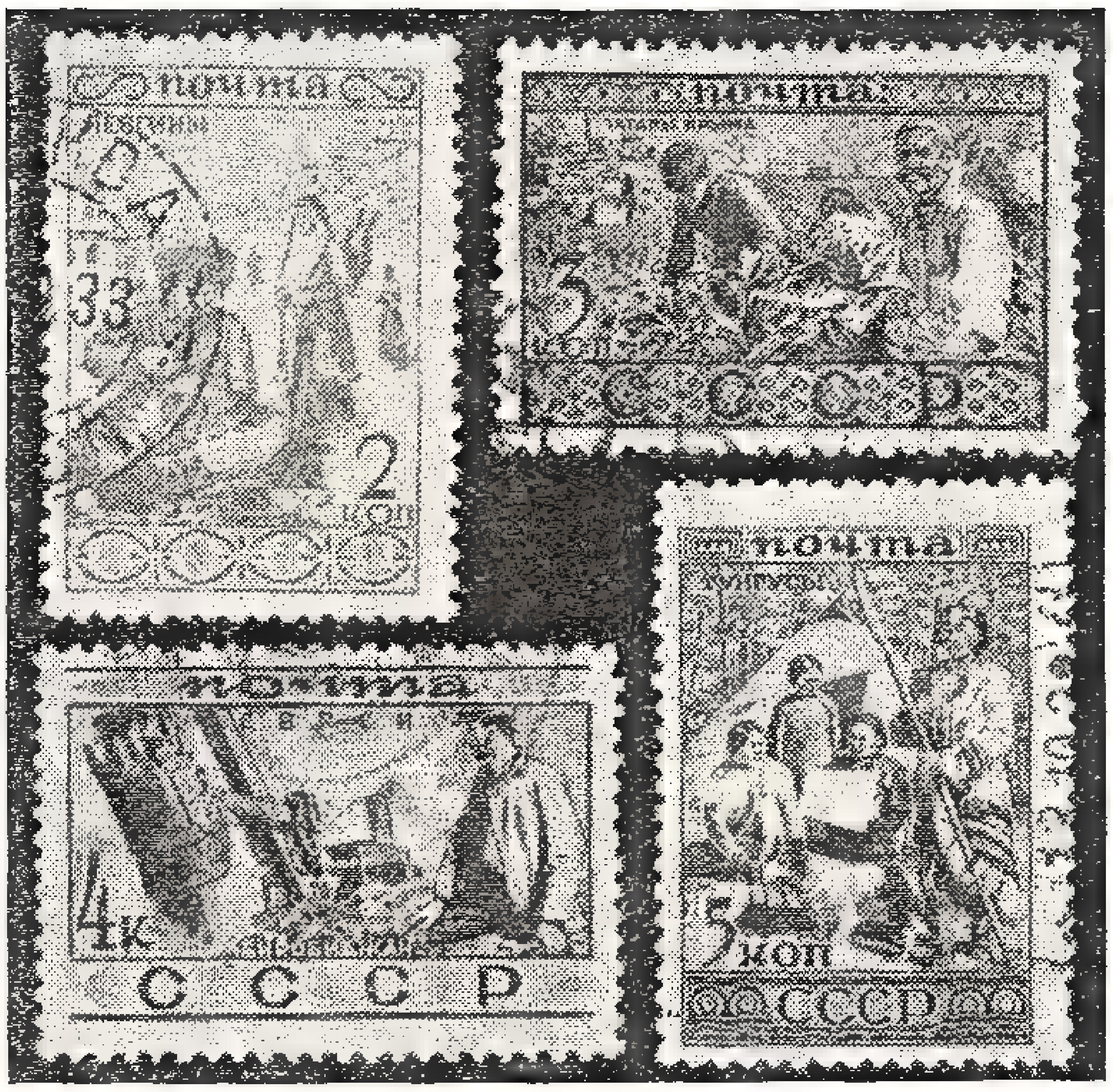

CARTER'S
EVERYTHING FOR
POULTRY AND
PIGEONS
SUNNY SMILE
TOFFEE
DU LAIT
Brings Miles of Smiles
012033

Some of the queer ads seen on transfer tickets of England and Nova Scotia. Face of transfer at lower right is ½ size.

U. S. 23 Year Old Stamp Still Sold

JUST step up to the postal savings window of your local postoffice and throw down a dime. If you decide you don't like the stamp, buy nine more, paste them on a card, and you'll get your dollar back.

21 Soviet Peasant Scenes on Stamps


почта
2
5
СССР
4к
СССР
5коп
СССР

4 stamps from Russia's ethnographic issue. There are peasant scenes from Siberia, Uzbekistan, and other wild places.

THE latest stamps put out by the Soviet Union comprise one of the most picturesque sets of stamps ever issued. There are 21 different stamps, each depicting one of the many races which make up this great country. From the cold waste-lands of the

(Continued on page 116)

WANTED — MEN FOR TEA and COFFEE ROUTES

make up to $42.50 a week

NO EXPERIENCE NEEDED—I WILL GIVE YOU WHAT LITTLE TRAINING NECESSARY—NO RED TAPE—EARNINGS START AT ONCE

> The future welfare of thousands of deserving men who heed this announcement may be vitally affected. Many who have been beset with financial distress can find prompt and permanent relief from their money worries.

FOR YEAR 'ROUND INCOME

Stop and think how wonderful it would be to have a nice income every week in the year. No more tramping around looking for work. No more "penny pinching." Have money to help pay your nagging bills—buy clothing—pay off the mortgage—buy yourself a home—put money in the bank—or whatever your heart desires. That's the kind of a business opportunity I am offering you.

TEA AND COFFEE ROUTES PAY BEST

Everybody knows there is nothing better than a good weekly route for a fine, steady income. These Tea and Coffee Routes pay far better than most because you supply nearly 300 products—things people use daily in order to live. You simply take care of the customers' orders on the route in your locality. You collect all the cash and keep a big share of it just for looking after the orders, delivering the goods, and taking care of the business. I furnish you with hundreds of fine premiums and special bargain offers — premiums to give away with Tea, Coffee, Spices, Extracts, Baking Powder and other fine products. Hundreds are now waiting to be served in many localities. Daily and weekly earnings mount steadily where you call on your route regularly.

YOUR OWN FOOD PRODUCTS AT WHOLESALE PRICES

When I send you instructions for making money on my new neighborhood Tea and Coffee Route Plan, I also give you rock-bottom wholesale prices on your own groceries and household necessities. This is in addition to your regular daily earnings, so you make big money in cash and save big money on the things you use in your home.

GO TO WORK AT ONCE

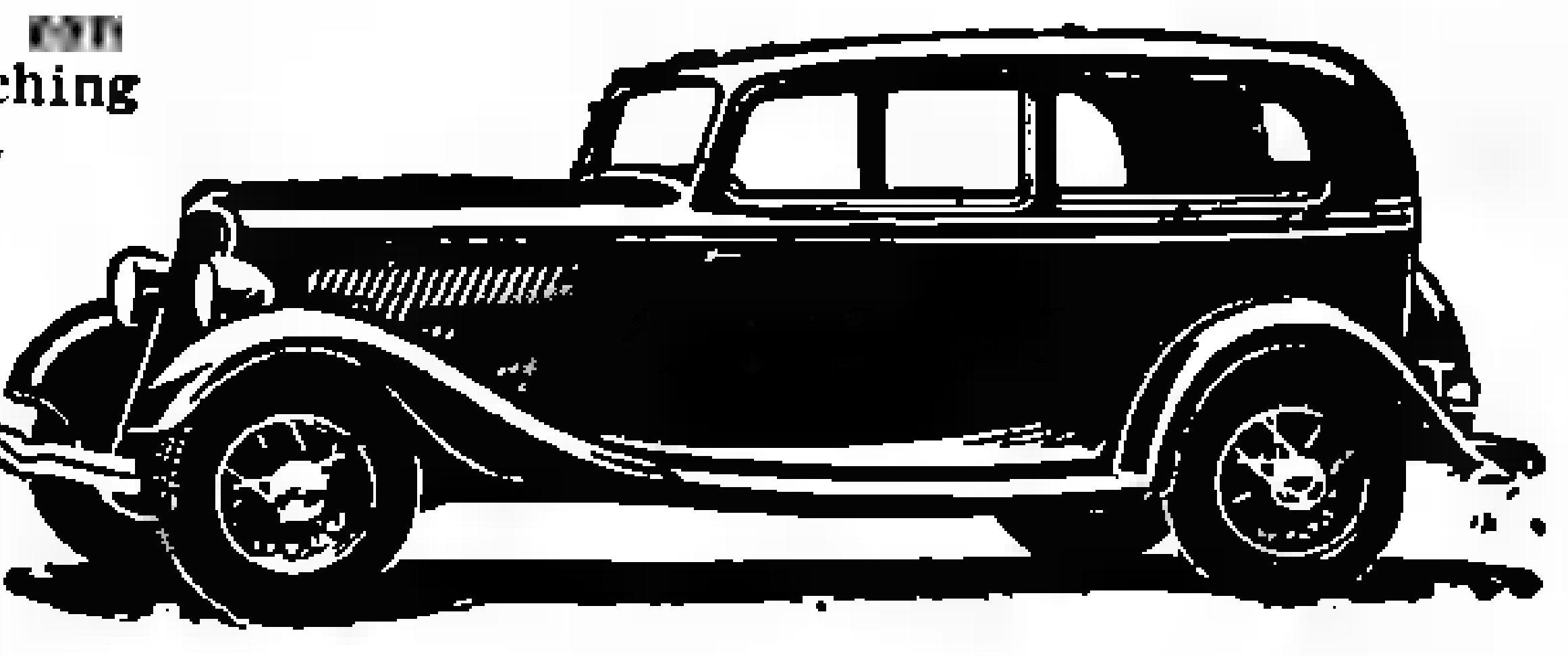
My new plan provides immediate cash earnings. As long as you are honest and reliable you are eligible for one of these routes. I want someone in every territory because I have opened up my big plant in full capacity. I am going to help a lot more people earn more money at once. You can have one of these good paying routes right in your own locality right near where you live. Better send name today.

EXPERIENCE OR TRAINING UNNECESSARY

I am not nearly as much interested in your past experience as I am in your willingness to follow a few plain instructions that will tell you the inside workings of this profitable business. I will explain just how you go about placing Tea, Coffee, Spices, Extracts and Household Products with the customers on your route. I furnish everything. There is no stock to carry—you fill your orders from my big factory stock. You have entire charge of everything.

NO MORE "PENNY-PINCHING"

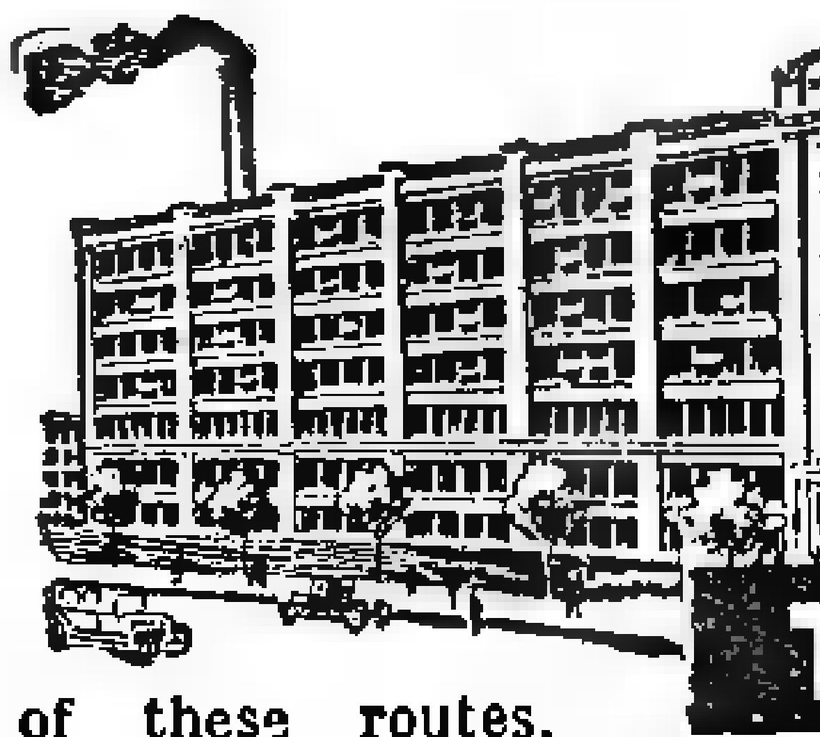
If you have been working for a boss and your pay has been limited and you are weary of pinching and striving to exist, here's an opportunity to change all this. With my route plan you can stop time-clock punching forever. If you want earnings that run up to $42.50 a week you can have them. Your weekly income is limited only by the time you give to the business. The more time you devote to my wonderful Route Plan, the more money you make for yourself. That's the kind of an offer I am making to you.



FORD SEDAN FURNISHED TO PRODUCERS AS AN EXTRA BONUS NOT A CONTEST OR A PRIZE

LOOK AT THESE UNUSUAL EARNINGS

I am receiving glowing reports from both men and women who are already handling some of these routes. M. Mitchell, Cal., reported profits of $75.00 in six days. Wm. E. Berkhimer, Pa., cleared $20.00 in one day and $90.00 in a week. Wm. H. Newcomb, N. Y., made $24.00 in one day. Wm. E. Walker, Conn., made $68.00 during spare time in three days. I have many more reports like these exceptional earnings. I now offer you an even better opportunity than I gave to them.



FACTORY FRESH FOODS NOW IN GREAT DEMAND

ZANOL
Quality
COF
TEA

My Tea, Coffee, and other Food Products are fresh from my big, modern Pure Food Kitchens—all have been tested and approved by the American Testing Institute—a very high authority on quality. It's no wonder people insist on having my brand in preference to others. I'll explain all of this more fully in the big booklet that I will send you free just as soon as I get your name. My goods have been advertised nationwide to millions of people. There is nothing new or untried about any of my plans.

DON'T SEND MONEY—JUST YOUR NAME

Don't confuse this with anything you have ever read before. I don't need your money—I need people to operate good paying routes. Send me your name so I can lay the facts before you, then you can decide if the earning possibilities are satisfactory. Don't expect me to wait indefinitely to hear from you. If you act promptly it will indicate you are the right person for the route. Send name on coupon or penny postcard for free facts. Do it today.

3 THINGS TO DO

1. *Mail Coupon*
2. *Read Facts*
3. *Start Making Money at Once*

TEA and COFFEE ROUTE COUPON

ALBERT MILLS, President
5018 Monmouth Ave., Cincinnati, Ohio

Send me full particulars of Tea and Coffee Route Plan, showing how I can get started earning up to $42.50 a week at once. This is without obligation to me.

Name ....

Address ....

....

(Please Print or Write Plainly)

MIND POWER
ASTOUNDING RESULTS AWAIT YOU

Your destiny is NOT in the hands of the Gods of Luck or Chance. Don't be a slave to conditions—like chaff in the wind. You are endowed with mighty MENTAL and PHYSICAL POWERS. These powers are lying dormant, unawakened, within you. A few simple rules used every day will be the means of bringing about lasting HEALTH, HAPPINESS and FULFILLMENT OF YOUR IDEALS.

THE WAY

A world-wide movement, the Rosicrucian Brotherhood, for years has shown sincere men and women how to use their INNER FACULTIES to overcome LIFE'S OBSTACLES. Why look around for help?—within is the solution.

FREE INTRODUCTORY BOOK

Sincere seekers may secure a new book, "The Wisdom of the Sages." It explains how you may receive the secret Rosicrucian teachings in the privacy of your own home. It tells how YOU may learn of the wonderful laws used by the Rosicrucians throughout the world. If thousands have been helped by this study, why not you? Address a letter (not a postcard) to:

FRIAR R. S. C.
ROSICRUCIAN BROTHERHOOD
AMORC
SAN JOSE CALIFORNIA

Remember the Rosicrucians are NOT a Religious Organization.

GO TO HIGH SCHOOL AT HOME

Make up the education you missed. Study at home in spare time. Your choice of subjects. Expert instruction. Personal service. You make quick progress because you are in a class by yourself. Diploma. Mail coupon today for interesting FREE BOOKLET.

INTERNATIONAL CORRESPONDENCE SCHOOLS
"The Universal University" Box 2324-W, Scranton, Pa.
Without cost or obligation, please send me full particulars about the course I have checked—
☐ High School Course
☐ English ☐ Bookkeeping ☐ Accounting
☐ Civil Service ☐ Salesmanship ☐ Advertising
Name..
Address..

Tuning Up Your Car for Spring

(Continued from page 85)

front body bolts. These are the bolts located at the feet of the dash board supports. Continued tightening does not remedy the noise—but proper insulation will. Remove the bothersome bolts and clean and oil them. Then cut a strip of old innertube, so that when folded to two thicknesses it may be inserted between the frame and body. This may be easily done by spreading the members apart with a pinch bar. Then reinsert the body bolts, drive them through the rubber, and tighten securely.

Now tighten all other bolts and screws—those found on and under the dash, door hinges, window frames, steering wheel support, radiator holddowns, floor boards, fender and running board. Take up all play in the tie-rod and drag-link assembly of the steering control.

A good polish job is a good investment, for the time and money spent. A combination cleaner and polisher does a splendid job—a coat of wax over the cleaner makes a better and more lasting job.

Rocket Men to Invade Stratosphere

(Continued from page 51)

rocket and maneuvered a safe landing. The ascent lasted 10 minutes and 26 seconds.

Equipped with a knowledge of the experiments of all their contemporaries, the Cleveland rocketeers are ready to make progress with their own design which they think will have greater practical value than the products of the scientists across the sea.

In the final test of the model, Loebell stood behind a steel shield—mindful of the fate of other rocket-workers in dealing with the highly volatile gas combinations—and adjusted the fuel valves.

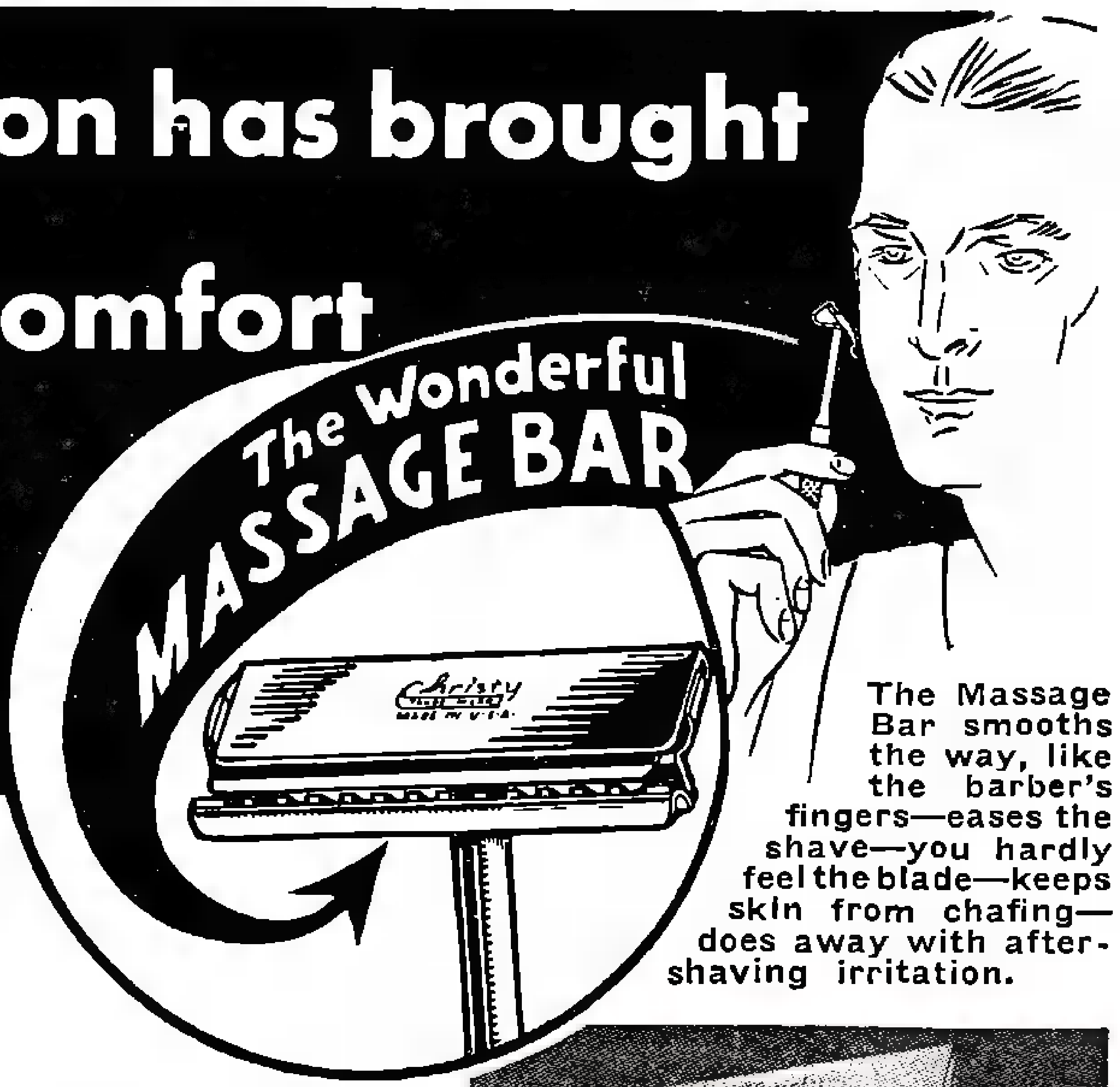
When everything was adjusted, Loebell warned everybody except Hanna to withdraw to a trench so they might watch the test through a slit in a heavy wooden barricade.

Loebell raised his hand in a signal to Hanna. The latter pressed an ignition switch connected with the combustion chamber.

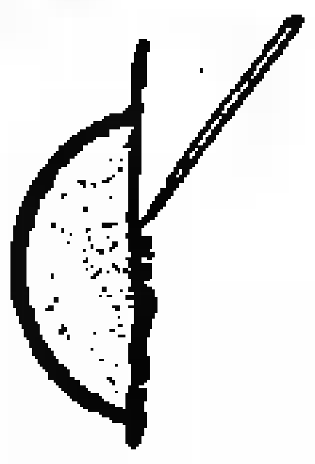
Tongues of yellow flame shot from the exhaust, changing to a bluish-white streak as Loebell readjusted the fuel valves. The staccato explosions of the exhaust became a dull drone. The motor tugged violently at its fastenings. Combustion lasted for five minutes, indicating that the completed rocket would easily have attained a five-mile altitude.

The completed rocket is expected to be fifteen feet high. When shot from the bottom of a thirty-foot shaft, its inventors hope to penetrate fifteen miles into the stratosphere. The shaft is necessary to give the rocket direction. When the rocket reaches the peak of its arc and starts falling, a delicate "trip" trigger will release a parachute to lower the rocket gently to earth.

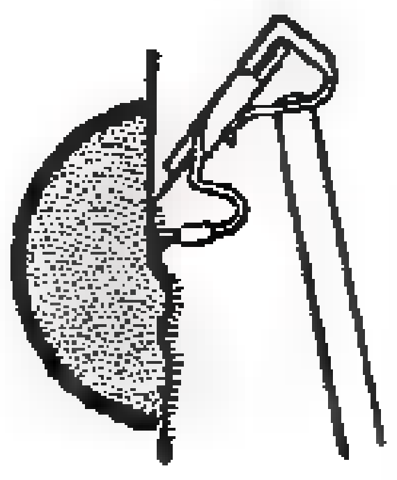
This little invention has brought added shaving comfort *to hundreds of thousands of men*



The Massage Bar smooths the way, like the barber's fingers—eases the shave—you hardly feel the blade—keeps skin from chafing—does away with after-shaving irritation.



WITHOUT the Massage Bar, the pressure of the blade naturally wrinkles the skin, which thus presents an uneven surface.



WITH the Massage Bar, the skin is smoothed in advance of the blade, which thus cuts the beard squarely at the base on a taut surface.

And Now You Can Try This Revolutionary Shaving Improvement *—at almost no cost!*

■ Send only 25 cents and you will receive a genuine Christy Razor with Massage Bar, and 3 Christy hand-finished blades, one in razor, 2 in separate package, all complete in handy container. Though the cost is only a quarter, your Christy will give you as fine a shave and as lasting service as any $1 or $5 Christy Razor. Try it—if not fully satisfied after 10 days, your money back.

■ The Massage Bar is only one of many outstanding features of the Christy Razor. In using the razor, note the "balance" and ease of handling, the positive positioning of the blade—no "fussing" or "fixing"—and the keenness of the hand-finished blades. You'll enjoy the mechanical perfection of this scientifically designed razor—the razor men are turning to for a quicker, easier, more comfortable shave.

NATURAL POSITION

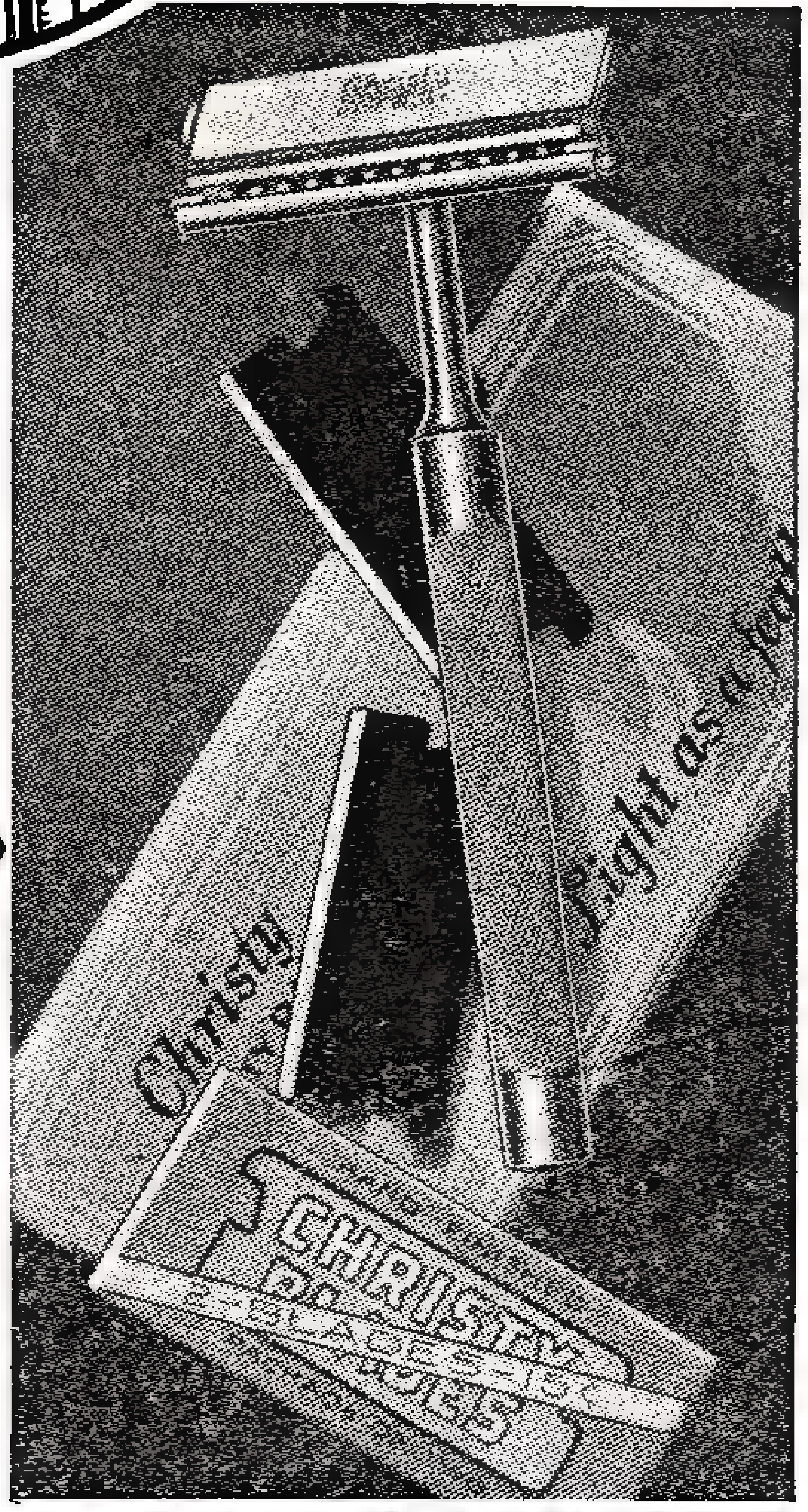
■ Handle the CHRISTY in the position in which a razor is NATURALLY used. This gives the long, diagonal stroke that the barber uses. You'll be amazed at the time saved and the wonderful results secured.

Accept this

ACQUAINTANCE OFFER

CHRISTY RAZOR with 3 blades 25c

For a new experience in shaving—try the CHRISTY "LIGHT-as-a-FEATHER" *shave.*



SHAVE CLEAN AROUND NOSE AND MOUTH

■ Don't worry any longer about shaving clean around the corners of the mouth, under the nose, or in any other of those hard-to-reach spots. Just try the CHRISTY and note the difference.

Try the CHRISTY RAZOR

■ —the product of specialists of 25 years' experience in designing and making fine razors and razor blades. Shave with your Christy for 10 days. If at the end of that time you're not fully satisfied, return it and we'll refund your money.

The CHRISTY CO.
Fremont, Ohio

Hand-Finished Blades

With your Christy Razor you get 3 of the genuine Christy Blades, made of the finest quality heavier-than-ordinary steel; finished by hand and packed by hand in a way that protects the fine edge. Christy Blades are sold by dealers everywhere.

Mail this coupon - SEND ONLY 25 cents

The Christy Company, Fremont, Ohio. XI (This offer good in U.S.A. only)

For enclosed 25 cents (stamps or coin), send me Christy Razor with 3 Blades postpaid. If, after 10 days' trial, I am not fully satisfied that the Christy gives me the best shave I ever had, I will return the razor and you will refund the 25 cents.

Name ....

Address ....

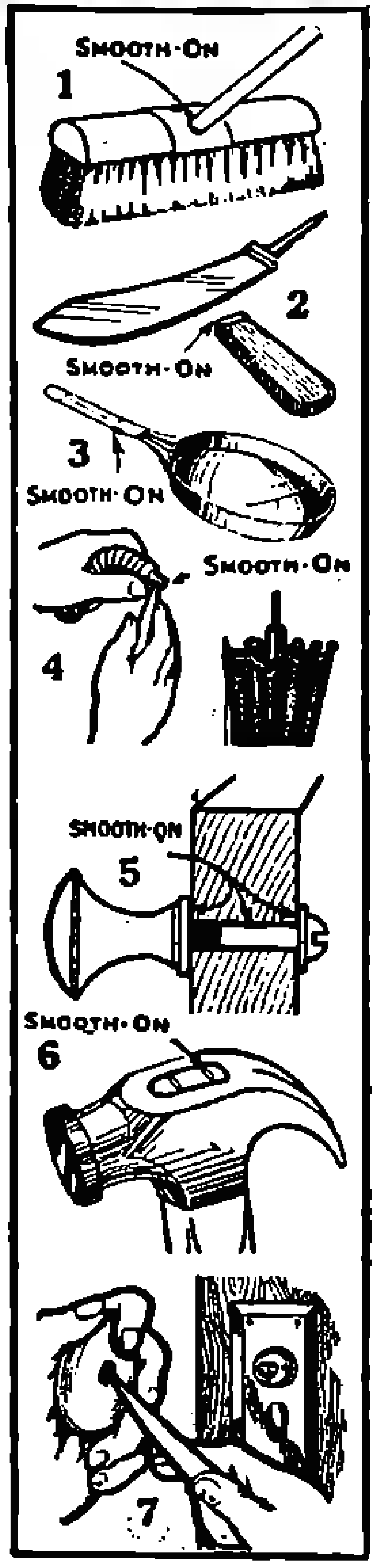
City .... State..............................

LOOSE HANDLES
QUICKLY MADE TIGHT

Mix a little Smooth-On No. 1 into a putty, put this into the opening, force the parts together, and in a few minutes the metallizing of the Smooth-On produces *lasting* tightness. Such repairs cost only several cents each and save many dollars otherwise spent for renewals that are no better.

In addition to quick, effective replacement of loose handles and knobs as suggested in the sketches, Smooth-On No. 1 enables you to stop leaks at cracks and joints in steam pipes, radiators and boilers, in water pipes and tanks, in gas pipes, in automobile radiators, engine water jackets, hose connections and in gasoline and oil lines, to make loose bolts, nuts, screws, etc., permanently tight.

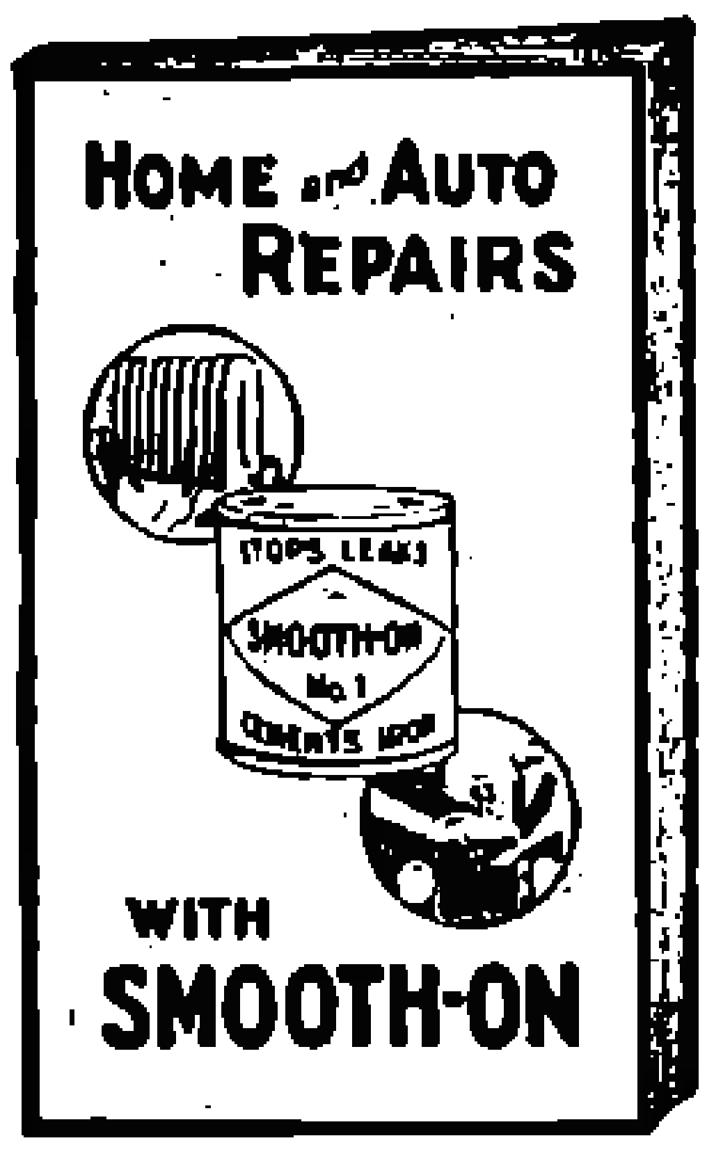
Smooth-On No. 1 after set and metallized holds water, steam, gasoline, oil, etc., under any pressure, and may be applied with equal success to any metal. It is also used for anchoring and taking up looseness, and holds in masonry, tiled walls, slate, wood, etc.



By doing your own household and automobile repairing with Smooth-On No. 1, all the Smooth-On repairs you make in a year will probably cost you less than any one of them made by a professional mechanic—and you will be surprised at the [illegible] of application and the number of places where Smooth-On can save money.

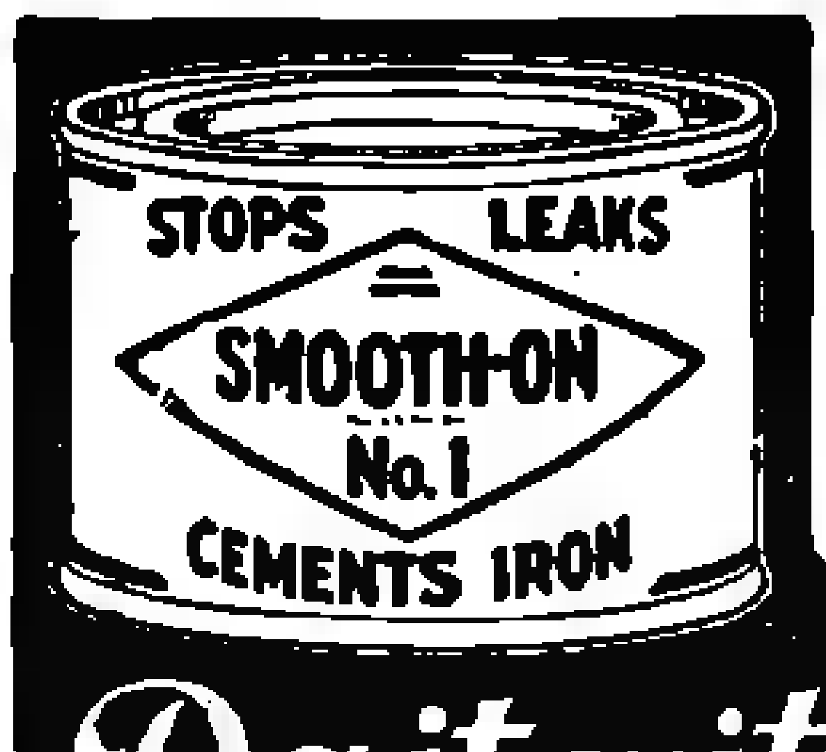
Keep a can of Smooth-On No. 1 in your tool box and be ready for emergencies. Do your own repairing and at the end of the year you will find that your efforts have been handsomely rewarded.

The free Smooth-On Repair Book gives full instructions.



Write for
FREE BOOK

Get Smooth-On No. 1 in 7-oz., 1-lb. or 5-lb. tins at nearest hardware store or if necessary direct from us.



Do it with SMOOTH-ON

SMOOTH-ON MFG. CO., Dept. 69
574 Communipaw Ave., Jersey City, N. J.
Please send the free Smooth-On Repair Book.

Name ....

Address ....

5-34 ....

Study Clouds to Forecast Weather

(*Continued from page 63*)

Light drizzling rain often falls from alto-stratus clouds, a high, gray sheet through which the sun may be faintly seen.

Clouds must really be observed on the horizon to the windward in order to be of value in forecasting, for when overhead the weather that goes with them is already present. Often cumulus clouds may be overhead, but by watching the horizon to windward the cumulus may be seen to become dark and ragged on the bottom, changing to cumulo-nimbus, which means rain.

The appearance of the sky at sunrise and sunset is quite accurate in forecasting. A red evening sky indicates fair weather, while a sunset of green or yellow may be taken as an exceptionally favorable sign.

For those who get up early enough, the sunrise also has something to tell. A gray, gloomy sunrise is a good sign, while a brilliantly tinted sky at sunup means that conditions are right for rain.

The appearance of the moon and stars indicates the amount of moisture in the air. When the outlines of the moon are sharp and the stars are seen distinctly the weather will be fair. When the stars twinkle and the moon appears hazy conditions are right for rain or snow.

Bodyguards Face Death

(*Continued from page 81*)

became the vogue among affluent lovers of home-like surroundings.

The requirements of the profession are varied. A man must be courageous and have the physical strength to back up that courage. He must be educated and refined so that he can accompany his employer wherever the latter might go without finding the situation embarrassing. He must be able to wear clothes for all occasions. And he must divest himself of any personal ties which might suffer through long and unrelieved hours of service. For the comfort of his client and the advantage it gives him over a scheming criminal, a bodyguard must look as inconspicuous as possible.

A Breakfast Cabinet for the Cottage

(*Continued from page 112*)

1"x4" trim stock for the front door frames, and a 6" coping board at the bottom along front and side.

The back of the cabinet may be of inexpensive ¼" plyboard.

The 17½" wide front table will probably have to be made by gluing two narrower boards together. Use a 17½" length of piano hinge or three short brass hinges for this.

A half round top is made of two semi-circular plywood pieces capped by 1/16" plywood. Soak the plywood in hot water for a minute, and it will bend easily around the curve.

WHO ELSE WANTS 150 GALLONS of GAS *for Only $4.00*

Elling O. Weeks, Famous Aviator and Inventor, Tells You How to Get It

Automobile owners who have been worrying about gasoline expense, will be interested in an amazing invention that is now being offered to motorists by this famous Aviator. Already hundreds of thousands of cars have been equipped and their owners are wildly enthusiastic in their praise.

Here is Mrs. C. P. Blalock in her Ford car that ran 51 miles on a gallon of gas.

51 Miles on a Gallon Wins Contest

In an amazing test recently conducted by a Texas Motor Company, 23 cars were entered to determine mileage economy. The winning car, owned by Mrs. C. P. Blalock, pictured to the left, ran 51 miles on a gallon of gas, and the second car 49 miles on a gallon of gas. When official test records were published, it was found that both of these cars were equipped with Mr. Weeks' invention.

Emery Shaffer and Packard Limousine he drives.

Amazing Gas Savings on Big Cars

Owners of big cars need this new invention just as well as the owners of the smaller cars; the bigger the car the worse the gas eater and the more need of this saving. Emery Shaffer, 3826 N. Ashland Ave., pictured here, the chauffeur of a well known Chicago business man, says he is delighted with this device. Not only does it save him many gallons of gas every month but makes his car perform beautifully.

How You Get 150 Gallons for $4

The average automobile is driven probably 10,000 miles a year. Conservatively figuring this new device on 10,000 miles, it should save you anywhere from 150 gallons of gas and up, but figuring at the minimum—150 gallons of gas—this device only costing you $4.00, it is as easy as A B C to see that $4.00 does buy 150 gallons of gas, besides how about the second and third year when gasoline savings continue and there is no cost whatever. Make this test. No matter what kind of a car you have or how big a gas eater it is, this device must save you money. We guarantee that if it does not give you more power, faster pick up, less carbon, quicker starting and increased mileage a trial will cost you nothing. We invite you to test it at our risk—you are to be the sole judge. Mail free offer coupon today.

ELLING O. WEEKS, Pres.
The Whirlwind Co.
Dept. 991-A Station C Milwaukee, Wis.

FREE OFFER COUPON

WHIRLWIND CO.,
Dept. 991-A, Station C, Milwaukee, Wis.

Gentlemen: You may send me full particulars of your Whirlwind Carbureting device and tell me how I can get one Free. This does not obligate me in any way whatever.

NAME..

ADDRESS..

CITY........................*STATE*..............

☐ Check here if you are interested in full or part time salesman position.

NEW LOW PRICES
GOODRICH-Firestone GOOD YEAR U.S., FISK and OTHERS $2.15 29x4.40-21

SAVE ON YOUR TIRES WE WANT DEALERS

YOU CAN'T BEAT OUR PRICES

And we defy anyone to excel our quality. Every standard brand tire reconstructed by our superior, modern method is positively guaranteed to give full 12 months' service under severest road conditions. This guarantee is backed by the entire financial resources of an old reliable company

Todays Lowest Prices

BALLOON TIRES

Size Rim	Tires	Tubes
29x4.40-21	$2.15	$0.85
29x4.50-20	2.35	.85
30x4.50-21	2.40	[illegible]
28x4.75-19	2.45	.95
29x4.75-20	2.50	.95
29x5.00-19	2.85	1.05
30x5.00-20	2.85	1.05
28x5.25-18	2.90	1.15
29x5.25-19	2.95	1.15
30x5.25-20	2.95	1.15
31x5.25-21	3.25	1.15
28x5.50-18	3.35	1.15
29x5.50-19	3.35	[illegible]
30x6 00-18	3.40	1.15
31x6 00-19	3.40	1.15
32x6.00-20	3.45	1.25
33x6.00-21	3.65	1.25
32x6.50-20	3.75	1.35

REGULAR CORD TIRES

Size	Tires	Tubes
30x3½	$2.35	.75
31x4	2.95	.85
32x4	2.95	[illegible]
33x4	2.95	.85
34x4	3.25	85
32x4½	3.35	1.15
33x4½	3.45	1.15
34x4½	3.45	1 15
30x5	3.65	1.35
33x5	3.75	1 45
35x5	3.95	[illegible]

HEAVY DUTY TRUCK TIRES

Size	Tires	Tubes
30x5 Truck	$4.25	$1.95
34x5 Truck	4.25	2 00
32x6 8 ply. Tr.	6.95	2.75
32x6 10 ply. Tr.	7.95	2.75
36x6 Truck	8.95	3 95
34x7 Truck	9.95	3.25
36x8 Truck	11.45	3.95
40x8 Truck	13.25	4.15

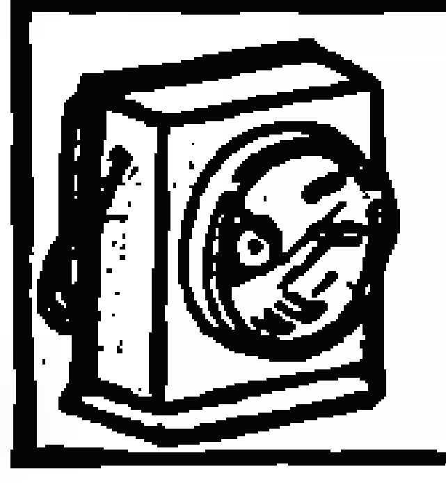
All Other Truck Sizes

ALL TUBES ARE GUARANTEED BRAND NEW

SEND ONLY $1 DEPOSIT on each tire. (On each Truck Tire send a $4 deposit.) We ship balance C.O.D., 5 per cent discount for full cash with order. Any tire failing to give 12 months' service replaced at half price.

12 MONTHS WRITTEN BOND GIVEN WITH EVERY TIRE

GOODWIN TIRE & RUBBER COMPANY Dept. 802
1840 [illegible] MICHIGAN AVE. CHICAGO, ILL



FREE "RAY-O-VAC" Lantern with Order for 2 Tires

Ready for instant use—no complicated wires to attach—no danger of burnt out fuses and lights. Cannot be replaced as a household and automobile necessity—a nationally advertised product.

STRING your own RACQUET

Same Quality String As in Expensive Racquets

Outfit Complete with string, tools and directions $1.65

Easy to restring racquets—better than new. Saves real money. Send for this professional outfit today. Good profits made restringing other players' racquets. 37 ft. string, colors Purple, Green, Red or White—also Scarletand Black Spiral—with contrasting silk trim, awls, illustrated easy directions. Money back guarantee.

MAKE MONEY TOO!

Send check or Money Order $1.65 which includes Postage and Insurance. Sent C. O. D., if desired, 15c extra.

[illegible] Tennis String Co. Dept. W-2 Harmon, N. Y.

How to Restring a Tennis Racquet

(Continued from page 101)

er size, it generally proves a bit clumsy.

After the racquet has been fastened in the vise, the 19-foot length of string must be prepared. Wax string to prevent fraying.

If the racquet is drilled for 18 vertical strings, the center of the main string will be at the top of the frame, as in Fig. 4.

If the racquet has a hole through the handle, it is drilled for either 16 or 20 vertical strings; the main string must then be started as in Fig. 5 with the center of the string in the hole through the handle. Procedure is indicated by grooves in frame.

The gut should be strung through all the holes; when putting in the outside vertical string on each side, however, skip one hole at the bottom as indicated at (A) in Fig. 7.

The ends of the gut are inserted under the loops formed by the other strings on the outside of the frame on both sides. Picks should be inserted in the holes marked (A) in Figs. 7 and 8, to prevent the gut from slipping.

First one-half of the vertical strings are tightened, then the other. Standing on one side of the racquet, the restringer should grasp the center string nearest him with his left hand and pull it upwards and outwards.

Tightening Last String

The slack is taken up in the last string by moving the pick from hole (A) to (B), and removing the slack by pulling the string with pliers; then the pick is reinserted in hole (A). The picks should not be removed until half the cross strings have been installed.

Repeated tightening will cause the racquet to assume a rounded shape, but the frame will regain shape as cross strings are put in.

The cross strings are begun at the top end of the frame. The knot is fastened as in Figs. 9 and 10 on the fourth vertical string from the center. The string is then woven between the vertical strings.

Each cross string is tightened separately by wrapping the string around the wooden dowel pulling tight, and securing with a pick. The pick should not be removed until the next string has been tightened and secured.

If the gut breaks it can easily be spliced in the manner shown in Fig. 12.

The gut (A) is kept from slipping by a pick. The broken end is cut off so that it projects about an inch beyond the adjacent hole. The new length (B) is inserted through the adjacent hole from the inside, and then turned and thrust back through the same hole, leaving a small loop over the broken end on the outside of the frame. The loop is pulled into the hole with a pair of pliers, drawing the broken end with it.

The last cross string (there are usually 21 or 22) is knotted at the bottom to a vertical string in the same manner as the top cross string in Figs. 9 and 10.

As a final touch, strings and knots should be given a thin coat of one part white shellac mixed with two parts of alcohol.

Amazing Sensational Discovery

REFINISHES AUTOS Like NEW!

PAYS AGENTS UP TO $30.00 a DAY

KAR-NU is a new, miracle discovery—a transparent magic-like fluid with which anyone can refinish any color automobile easily, quickly and economically without polishing, waxing, rubbing or painting. JUST WIPE IT ON WITH A CLOTH! IMMEDIATELY dullness, discoloration, shabbiness, sun fade DISAPPEAR. INSTANTLY, as if by magic, the old finish is rejuvenated and restored to the lustre, life glow and beauty of the original factory finish. KAR-NU dries in 15 minutes, sealing the pigment and protecting the finish from further wear. Lasts 8 to 12 months. GUARANTEED. Equal in beauty to a repaint or refinishing job which costs $25.00 to $75.00.

FREE SAMPLE

Enormous demand! Millions want it! Bowers made $9.00 on his first demonstration: Powell made $219.00 his first two weeks. Sell KAR-NU to individuals, fleet owners, [illegible] [illegible] accessory stores, used car dealers, etc. No experience necessary. Write for FREE sample to prove our claims and territory offer.

Not A Wax Polish or Paint Lasts 8 to 12 Months GUARANTEED

KAR-NU CO. Dept. W-41 Oakley Station, Cincinnati, Ohio

New METLMACH

THE MODERN MACH

Made of metal, never burns up, no burnt ends, ashes or stubs to discard. Absolutely water-proof. One Mach guaranteed to light 1000 times or more, lights only on itself thus saving the marring of clothing and furniture.

HAVE YOU SEEN IT?

If not, send $1.00 for 15 maches and counter display easel together with salesman's terms, convince yourself how readily they sell and make 50% profit. Single sample 15c. Every store a prospective customer. Every person a prospective user. Exclusive territory and steady business guaranteed industrious salesmen.

METALMATCH CORPORATION. 112 Water St., Warsaw, Ill.

NEEDED in EVERY HOME · USED by EVERYBODY EVERYWHERE!

MAN IN EACH TOWN

To Plate Auto Parts, Reflectors, Bathroom Fixtures, Refinish Beds, Mirrors, Chandeliers, by new method; no capital or experience required. Simple plan of manufacturing at home starts you in big money making business. Outfit furnished. Free particulars and proofs.

GUNMETAL CO. Ave. P Decatur, Ill.

Men Wanted at Once

Make Money Calling on Stores

PURE ASPIRIN
5
RAZOR BLADES
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New occupation. Pays big money at once without investment. Introduce sensational new line 5c and 10c necessities to stores. Self sellers. Permanent repeat business easy. Experience unnecessary. Start free. Write

PRO-CO-PAX
Box 37-W
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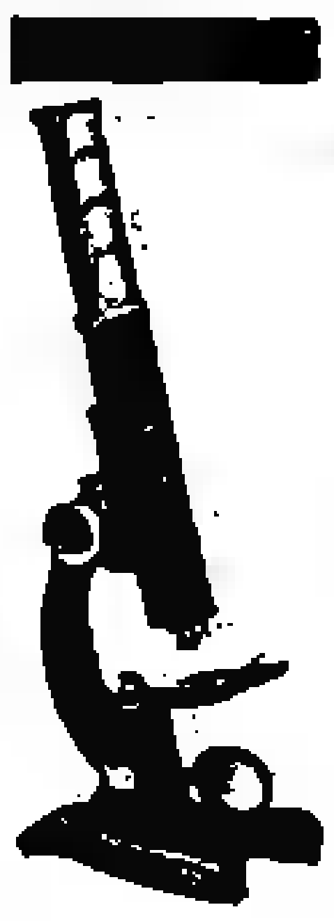
500 Power American Made MICROSCOPE $6.00



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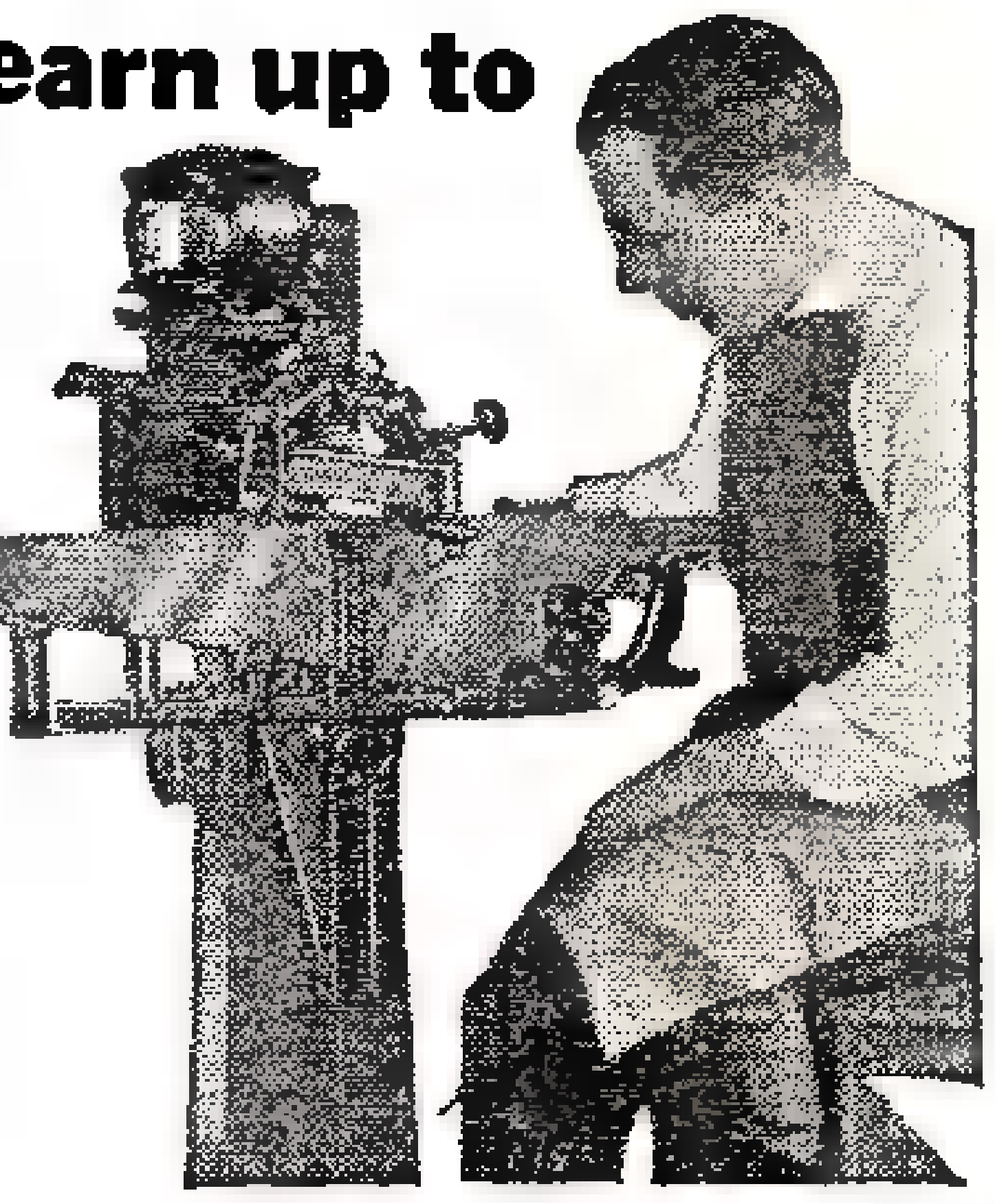

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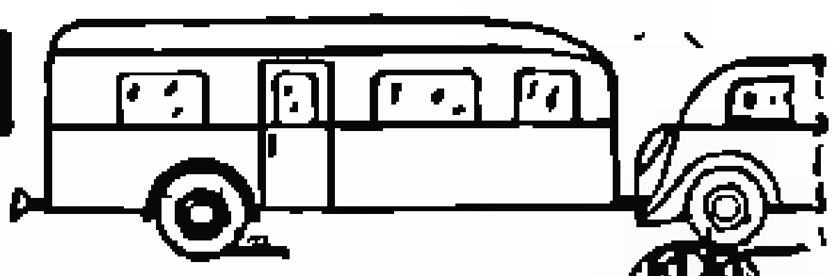

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Build a Suspension Trailer for Boat

(*Continued from page 105*)

modate a dory with 33" ends, a 25" freeboard, and 72" beam, it has an "I" shaped axle, 3" deep and 78" wide, approximately 24" above the wheel hubs. Wheels 48" in diameter are used. This permits the dory to ride about 15" above the ground. The axle uprights, also of 3" steel, are padded to protect the boat gunnels.

The longitudinal beam is held true with the axle by two sets of braces around 5' in length. From the elbows of the axle two pairs of 1½" angle irons extend to the upper surface of the beam. Approximately 11" inside the axle elbows two pairs of 2" strap irons reach to the under side of the beam. Bolts secure these sets of braces to the shaft and to each other. The mid point of the axle is fixed to the beam by a bolt or ring bolt and an additional strap iron brace extending both directions on the under side of the beam from the under surface of the axle. The grooved upper side of the axle is filled with wood in order to afford a flat surface for the beam rest.

The shaft is 20' 2" in length, and rests upon the axle at a point 11' 9" from the hookup. A semi-hardwood is suitable material, since the ⅜" flexible steel cable assumes most of the stress. From a shackle fastened to the hookup iron the cable passes through a ring set at the apex of a triangular truss, which is approximately 18" above the shaft. At the rear extremity of the beam the cable is shackled to a steel band which is a part of the fixed hook. A turnbuckle provides a means of obtaining the proper tension, and cable clamps on either side of the apex ring prevent slippage.

The front steel hook is fastened to a 1½" line in order that it may be moved handily along the beam to accommodate boats of varying lengths. Since the supporting shaft rides approximately 4' above the ground, the hookup will have to drop in the neighborhood of 24" if it is to be coupled with an extension from the frame of the average automobile.

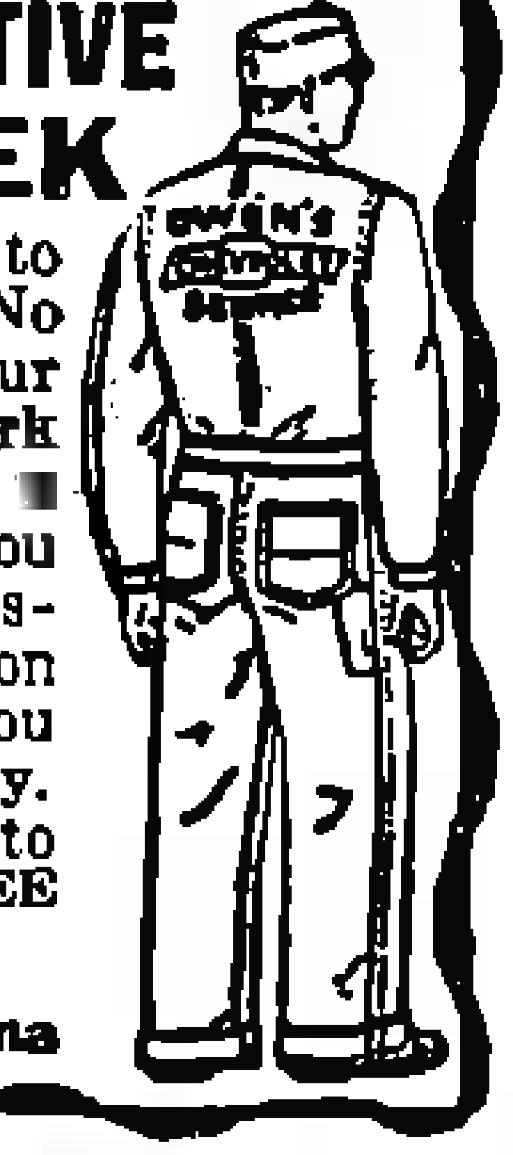
Thrills With Infra-Red Photography

(*Continued from page 106*)

even those you cannot see with your eyes, show prominently. Green leaves and grass and other surfaces which reflect the infrared rays of sunlight strongly are recorded as white.

Red-sensitive negative material must be handled and developed in total darkness or by the light of a green safelight designed for color-sensitive films and plates. Darkness always is to be preferred, at least until after development has progressed almost to completion.

Infra-red sensitive plates and films are developed, fixed and washed like any other kind, no special developers or other chemicals being necessary.



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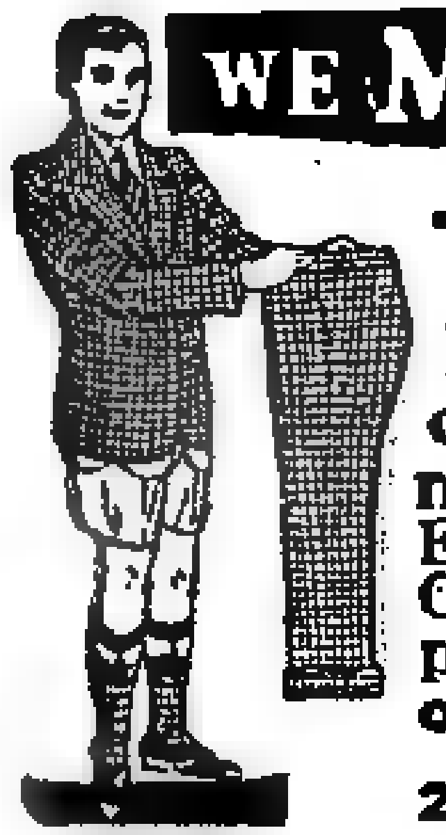

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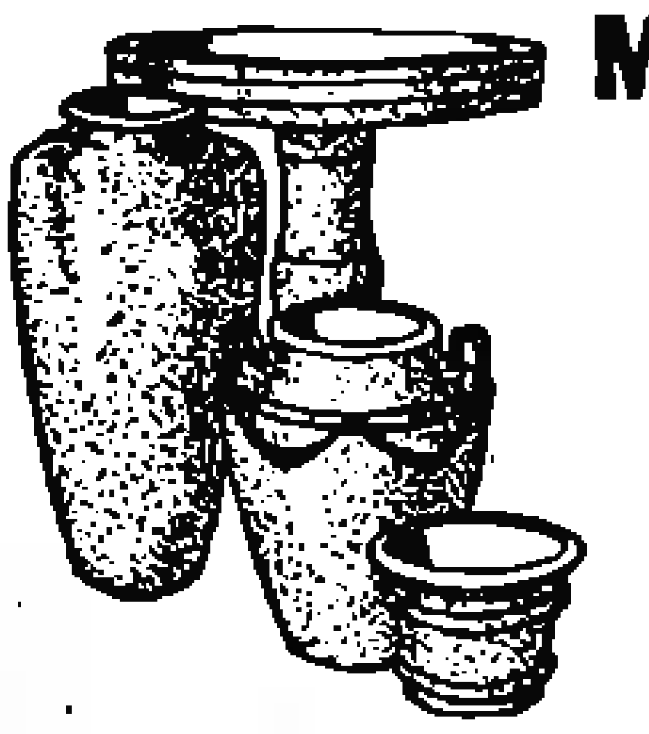

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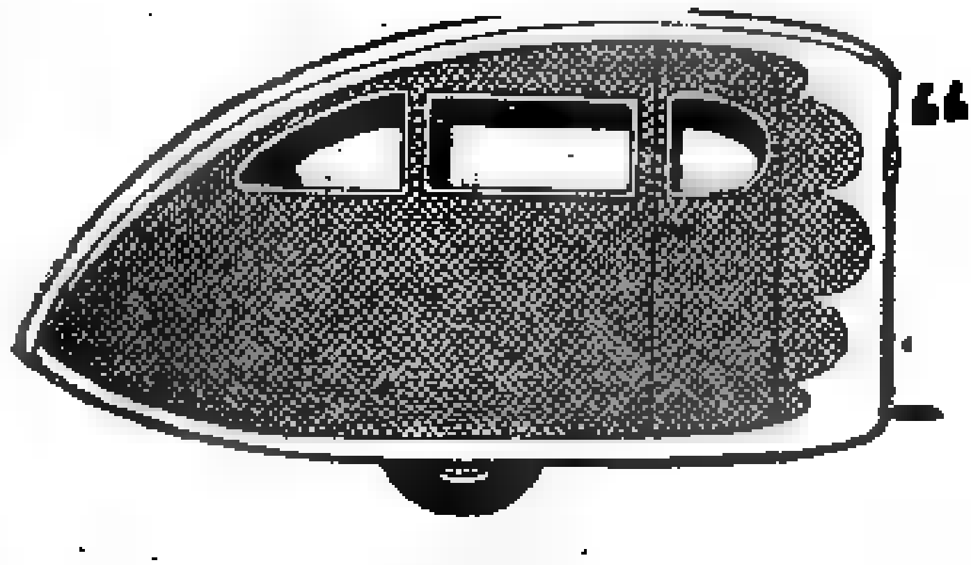

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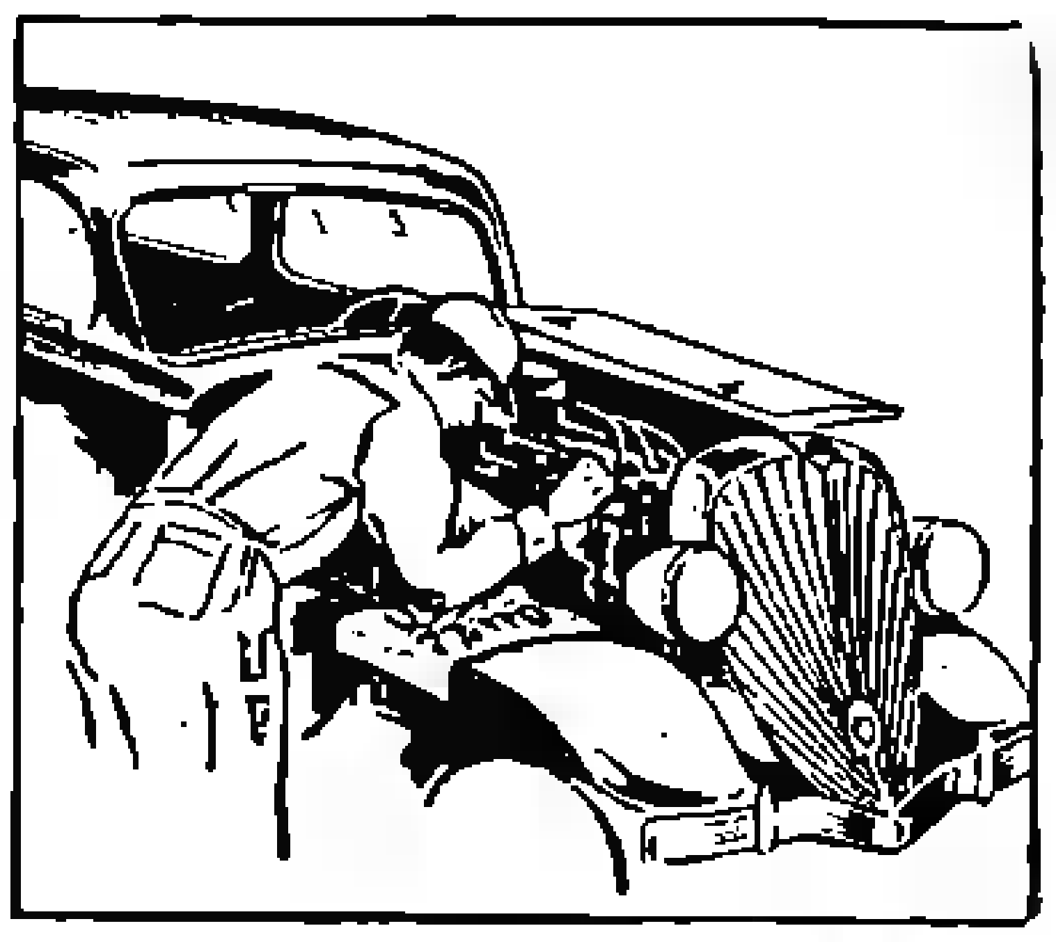

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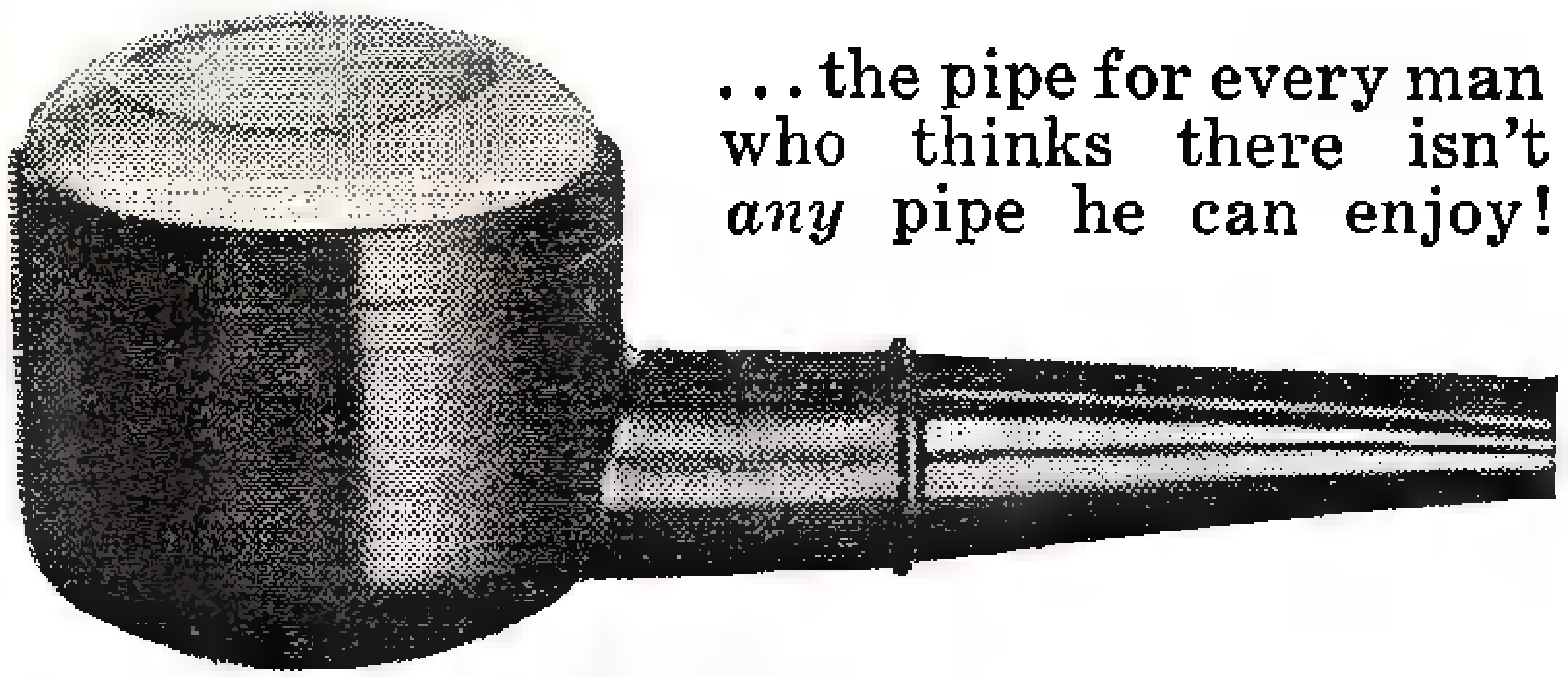

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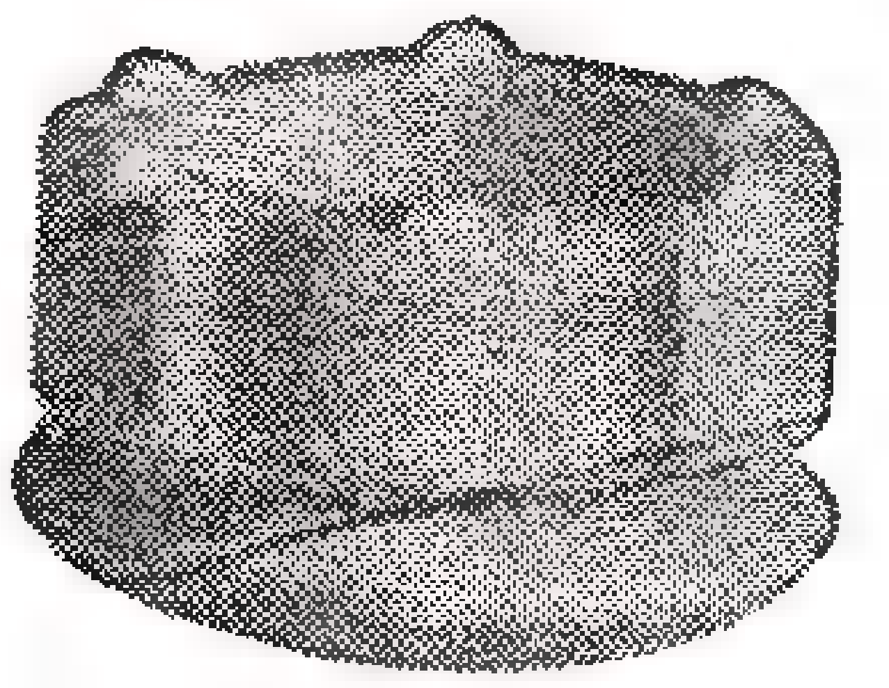
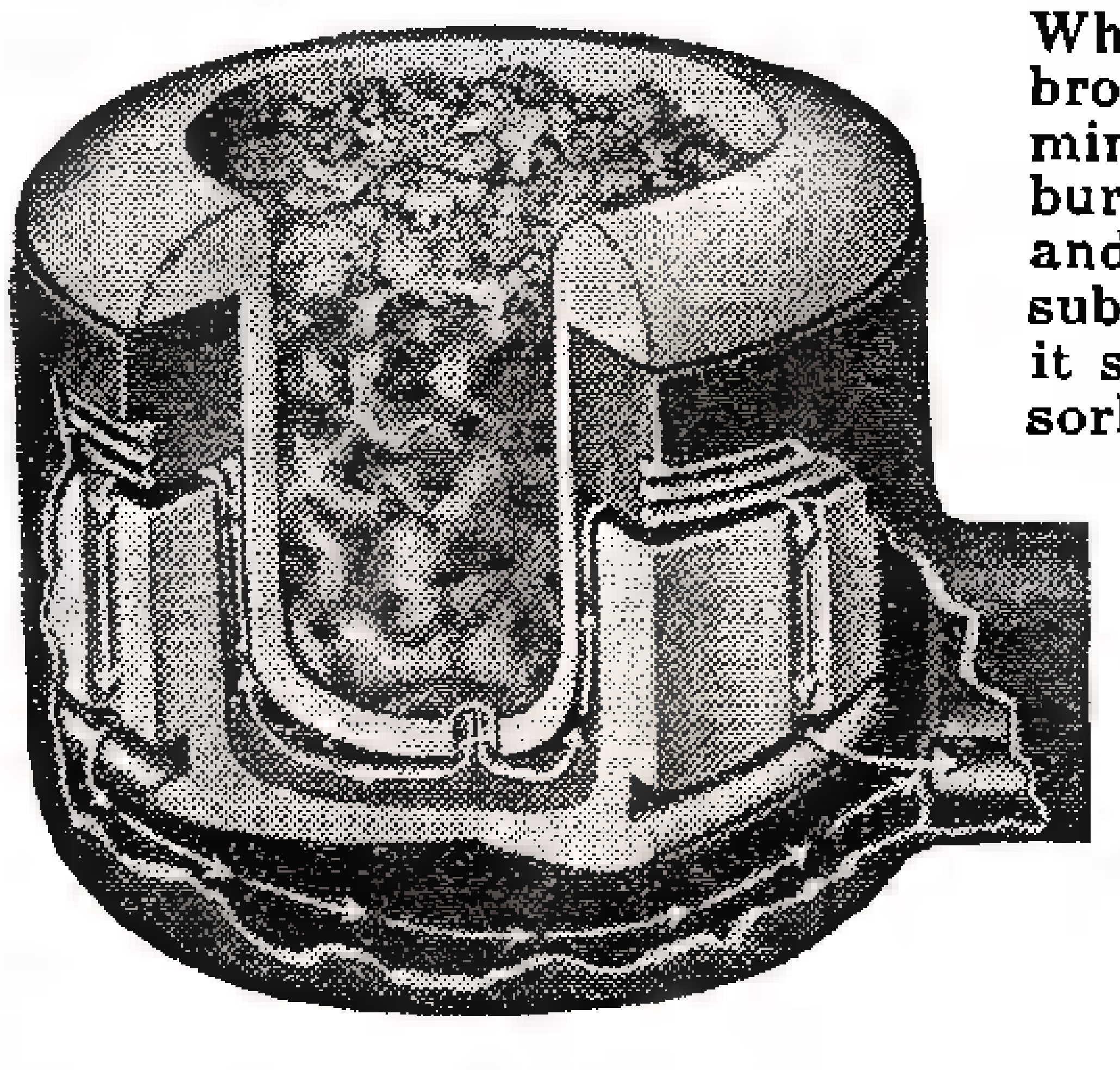
BUTTNER uses the "radiator" principle that cools your car. Every puff of smoke is drawn across more than 7 square inches of cooling, porous surface. This absorbent ceramic filter which surrounds the inner bowl (see X-ray below) sucks in all the heat, moisture and unhealthy toxins. Only cool, dry, sweet-tasting smoke enters your mouth. Nothing to irritate or harm tongue, throat and lungs.



Here's Why BUTTNER Smokes COOL and DRY Forever



When the filter gets brown and stained, a minute in a gas flame burns out all nicotine and other harmful substances and makes it snow-white and absorbent again. Now you know why the BUTTNER gives you the coolest, sweetest, driest, healthiest smoke you ever enjoyed. Sweet from the first puff; no breaking in.

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Dealers—write for trade price list. Restricted territory open for Distributors.

What's Wrong With U. S. Navy?

(Continued from page 72)

zation program" has since been carried out. Blister hulls were constructed around some of the old armor belts to provide old ships with effective protection against mines and torpedoes. Topside decks have been armored and strengthened against aircraft bombs, and steel "hats" were fitted over the smoke-stacks to keep enemy aviators from dropping their pineapples into the engine rooms. Airplanes and catapults have been installed. Various gunnery improvements were made, including anti-aircraft batteries and machine gun nests for discouraging aerial attack. Provision, of course, had to be made against the probability of gas attack from the air.

No 1934 American Battleships

They look like 1934 models but they are far from it. The cold fact is that a 1934 battleship is not to be had short of building one from the keel up. There will be no 1934 American battleships, however, because the Washington Treaty says we can't build them until 1937.

Now let us have a look at what happened after Uncle Sam surrendered his life insurance and flung the cash on the Washington and London poker tables.

England went through the gesture of scrapping 448,000 tons of naval ships, but what she scrapped was a lot of old packets that were about ready for the break-up yards. Japan junked 193,000 tons upon which construction had scarcely begun. France and Italy tore up some blueprints. Having scuttled most of the naval power we had, Uncle Sam sat back and considered the job all done! We did almost no naval building through the administrations of Presidents Harding, Coolidge, and Hoover.

Japan Increasing Naval Power

Meanwhile Japan has laid down or appropriated for 164 new vessels totalling 410,000 tons. England has laid down or appropriated for 148 ships, including two fine battleships, a total of 470,000 tons. Japan has steadily built up her fleet until she is now only a few tons under the treaty limits. England has built, or is building, so she will have a navy of approximate treaty strength by 1936. No other leading nation has shown the slightest inclination to follow our disarmament example.

With the start of President Roosevelt's administration, the navy found a new lease upon life. Warships are being built at a greater pace than ever before in peace time. In all 212,000 tons of new naval craft are being laid down. The navy will have 58 new ships that will bring it up to full treaty strength. Through 1935 $442,000,000 will be spent to carry out the naval program.

As this is being written congress is considering an additional 102 new ships at a cost of at least $380,000,000 to replace present ships when their age of usefulness is passed.

When this program is carried out the navy will rank second to none.

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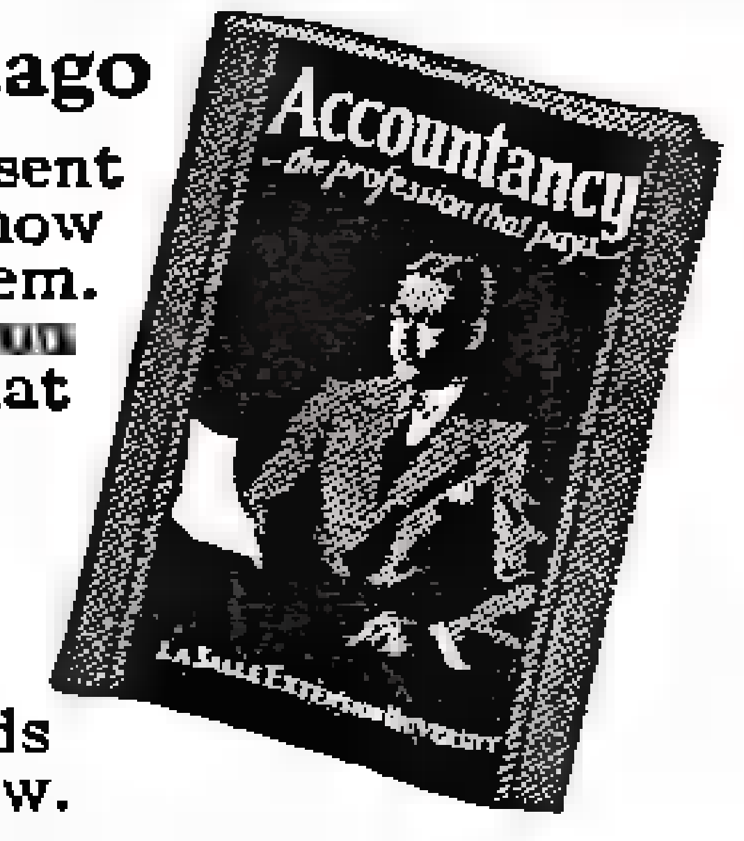

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Big Profits in Frog Raising

(Continued from page 87)

eggs each season; usually over seventy per cent hatch and develop into small frogs.

The advantage of frog farming is the fact that you can start practically anywhere and expand gradually as your profits mount. A vacant city lot, an old orchard or even [illegible] back yard can be utilized. Due to the cannibalistic nature of adult frogs, the frog farmer needs three separate ponds, segregating the breeders, tadpoles, and small frogs.

I have found a pond, 20x20 feet, water area, with bank space of six feet on all sides, to be capable of keeping six pairs of breeders. The water depth should not exceed 18 inches except for a pit in the center of the pond where the frogs hibernate in the winter time.

Confine With Poultry Wire

Ordinary one-inch mesh poultry wire four feet high with burlap sewed on the inside to prevent injury and to confine the smaller frogs, is the most sensible fence [illegible] frog farmer can use both for breeders and small frogs. Frogs breed from April until August.

At this time, the frog farmer must have a small pond about 10x15 feet planted with arrowheads, water moss and other aquatic plants, in readiness. The pond should be not less than three feet deep to take care of the thousands of tadpoles.

The egg mass must be immediately transferred to the small pond, using [illegible] scoop to handle them. In five days, each cluster becomes a wiggling, living mass of tadpoles. Tadpoles are scavengers, eating anything from table scraps to water moss.

In six to eight months, the tadpole begins to develop legs and in [illegible] short time is a small frog. At this time, its diet changes from that of [illegible] scavenger to being satisfied only with a *live* or *moving* food.

The growing pond for the offspring of six pairs should embrace about two acres, including shore line. Water in the two acre tract should cover not more than one-half of the entire area.

Feeding the Frogs

I have raised frogs on liver and other domestic meat but I found it impractical to consider this method of feeding on a large scale.

Small bullfrogs can be supplied with an abundance of insects, especially flies, by simply concealing several fish heads in the vegetation along shore. Common crabs, found in most any ditch or stream, and good food for frogs, can be placed directly into the growing pond where they will reproduce in enormous quantities.

When ready for marketing, the frogs are caught at night by blinding them with [illegible] search light. When the catcher gets a frog he puts it into [illegible] burlap sack with others. They are then put into small pens awaiting the dresser who grabs them by their rear legs and pierces the head with a nail by a downward stroke of the hand. The entrails are removed and the frog is ready for shipment in barrels of cracked ice.

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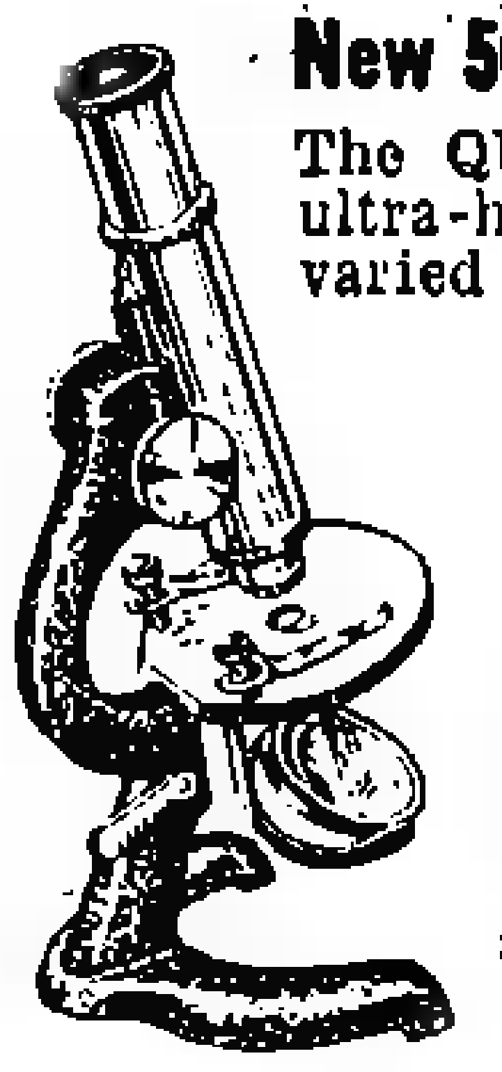

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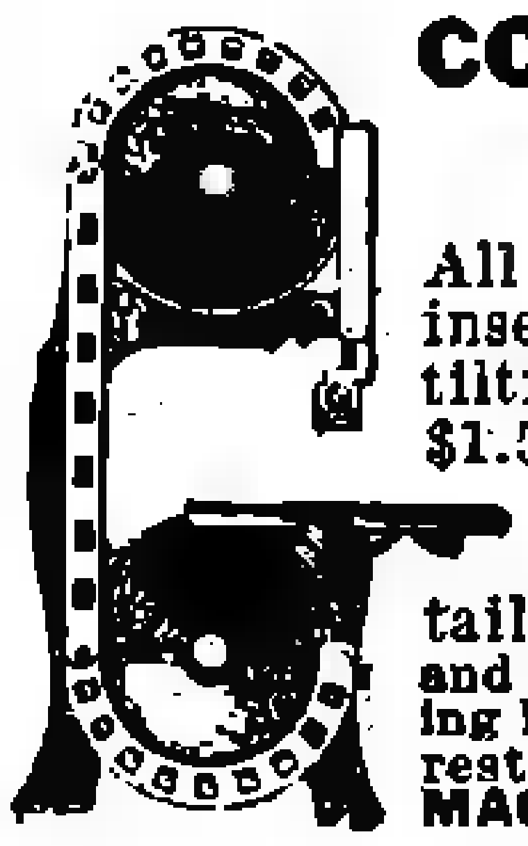

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30x4.50-21	2.40	0.85	28x5.50-18	3.35	1.15
28x4.75-19	2.45	0.95	29x5.50-19	[illegible]	1.15
29x4.75-20	2.50	0.95	30x6.00-18	3.40	1.15
29x5.00-19	2.85	1.05	31x6.00-19	3.40	1.15
30x5.00-20	2.85	1.05	32x6.00-20	3.45	1.25
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31x4	2.95	0.85	34x4½	3.45	1.15
32x4	2.95	0.85	30x5	3.65	1.35
33x4	2.95	0.85	33x5	3.75	1.45
34x4	3.25	0.85	35x5	3.95	1.55

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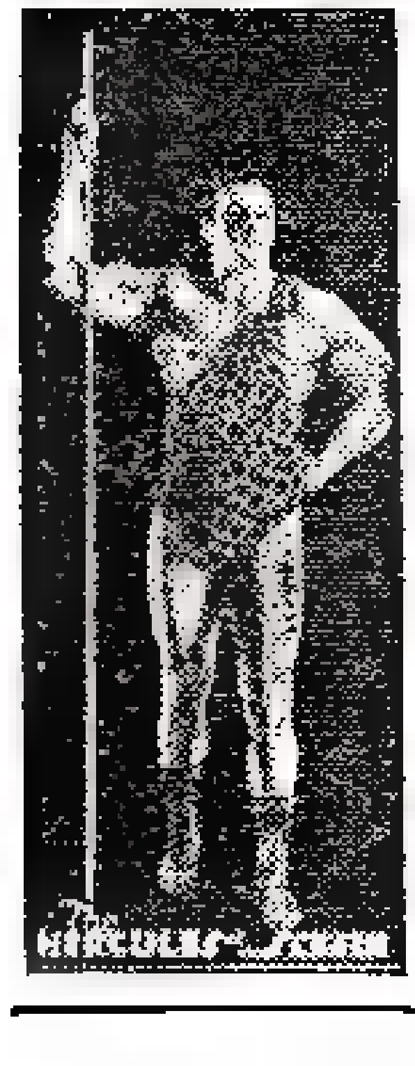

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Light Tents for the Outdoor Camper

(Continued from page 95)

favorite light tent. It is merely a typical wall tent with one of its walls and part of its inside eliminated, the half of the roof then being raised on crotched poles in front as shown in the illustration. In many ways the Dan Beard pattern of tent is an ideal shelter, its only fault being that it requires so many poles, guy ropes, pegs and fixings in general.

Can Be Made Any Size

The drawing showing a rear view of the Canoe Tent will at once give the reader an idea of the design and cut of this tent. It can be made any size that is desired. Following the lines of this drawing, and permitting the lines to stand for cords or strings, one can easily string out the design of this Canoe Tent, practically as shown in the drawing. In fact the lines of any shelter tent mentioned can be lined out with strings.

In outlining the Canoe Tent first tie a cord to the ceiling, rafter, or limb of tree. Draw this tight and fix to floor or ground.

The tent being five feet high in front, make a mark at that point. Run a cord down to the floor from either side of this mark to give you the front slope. Now line out the back which is four feet wide and two feet high, using some rod or stick to tie the strings to in lieu of the crosspiece on the crotches as used when the tent is erected out-of-doors. Thus proceeding from one angle to another the tent may be lined out and the total amount of canvas needed can readily be estimated, average canvas strips being 28 inches wide, which, allowing for over-lapping at seams, makes the width in between the seams, when sewed into the tent, 26 inches.

Making the Lincoln Tent

The writer fashioned a tent some years ago which is not only quite commodious, but has a number of other advantages. This tent stands five feet high, peak to ground, a length, floor measurement, of seven feet, and a width of six feet. To line this model out with your cords, attach the ridge arrangement (A in the illustration) to some object above, and let it hang down to within five feet of the floor. There is your height. Now let a cord down from the back to the floor, and one from front to the floor, space seven feet apart. Now put a cord down to the points B and C, and to like points on the other side, spacing the cords (as between the two sides) a distance of six feet for the width.

The section of canvas that contains the bobbinet is spaced centrally. Thus 13 inches to either side of the central mark D affix a tack in the floor and run a cord up from each tack to the peak. Do the same in the back, spacing the same. The space as between C and F must now be accounted for, it being necessary to fill in with a piece of canvas G which would otherwise be a waste piece from the piece H. There are four such sections to be arranged, one on either side of the bobbinetted section, and one on either side of the central section in back that corresponds with the like section as in front.

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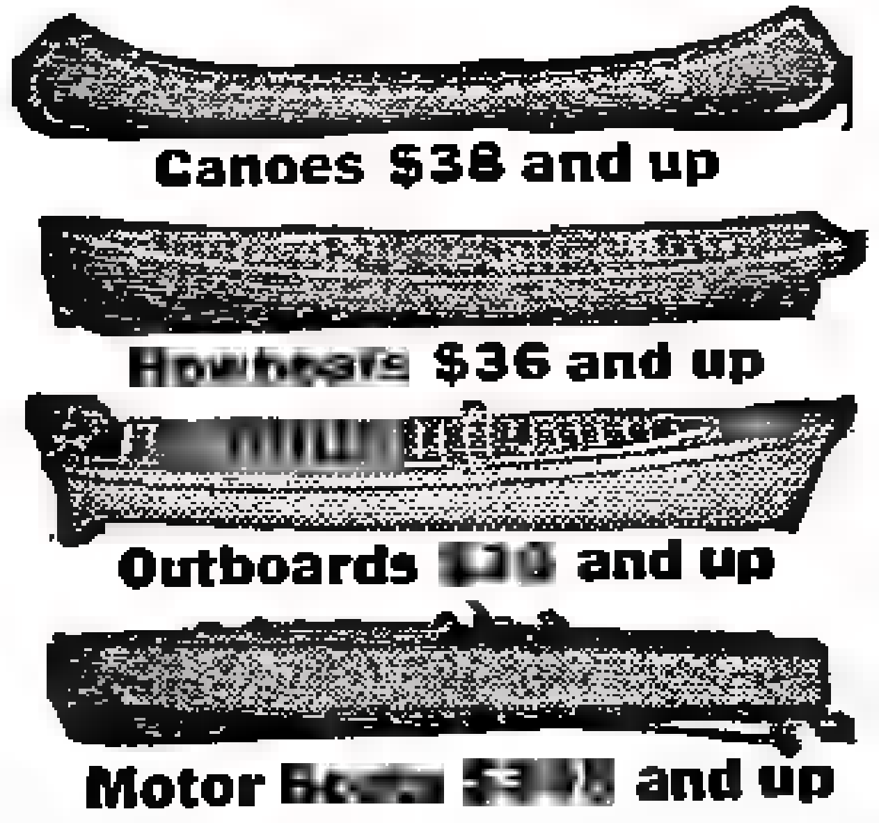

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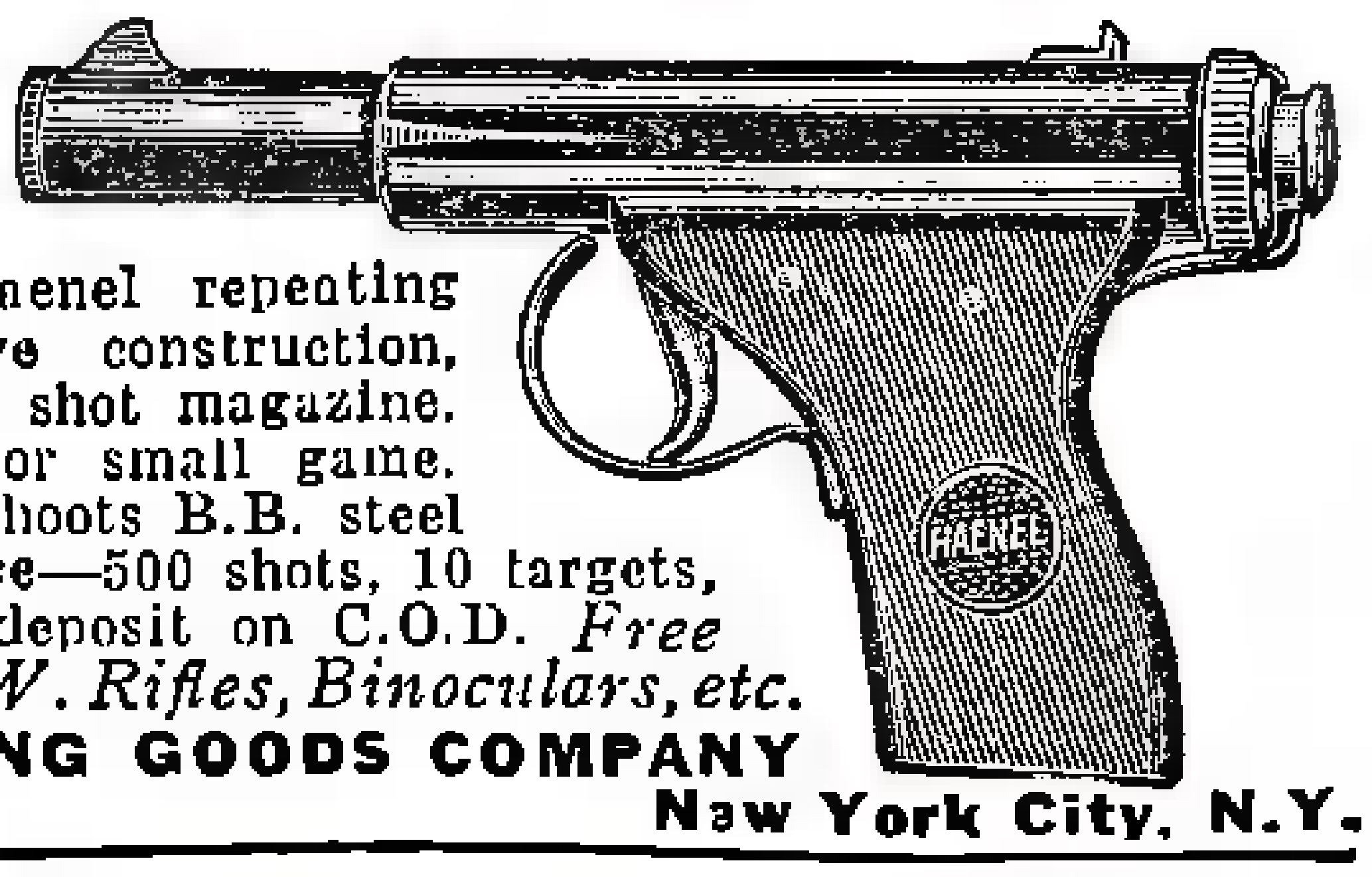

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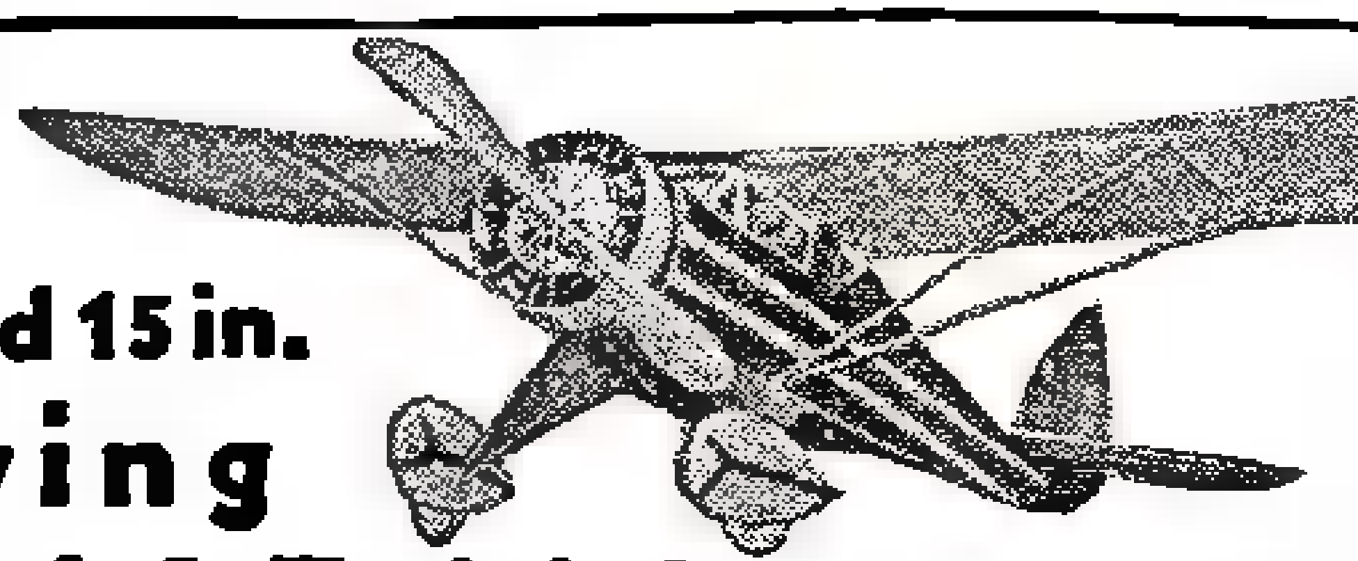

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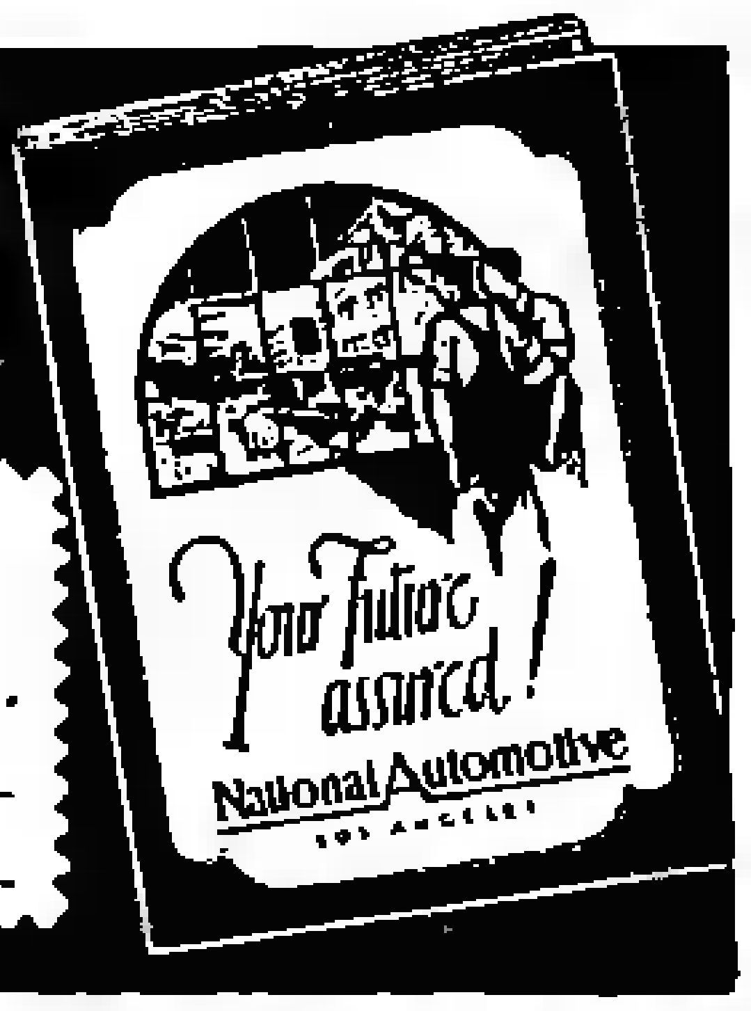

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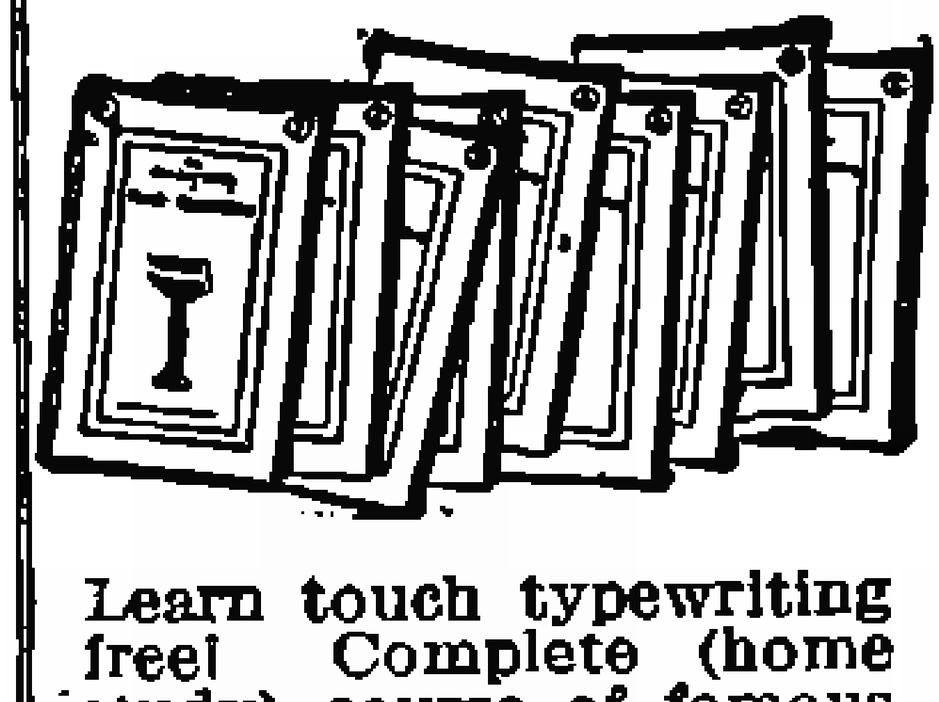

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Will Washington Monument Crash?

(Continued from page 35)

George P. Merrill of the U. S. National Museum who pointed out that there are three grades of marble in the monument, but only one, in his judgment, was of the highest type.

At the outset of the federal test program it was suspected that poor distribution of weight was a major cause of the widespread chipping away of the lower section of marble. It was decided to make a series of unique tests to determine whether this suspicion was indeed correct. First of all engineers, equipped with rock-boring instruments of unusual sharpness, bored tiny holes, about an inch in diameter, deep into the "granite rubble." Next, they placed pipes into the holes, sealed the pipes tightly with mortar and forced compressed air into them. Close observation showed that this air would blow out at numerous places. This offered conclusive proof that there were many hollow places in the masonry.

Having found out the main cause of the monument's deterioration, engineers called upon D. W. Kessler, building stone specialist of the Bureau of Standards, for advice.

Science Applies Pressure Test

As his test materials the scientist selected 16 marble cubes, 8 inches square, each weighing about 50 pounds, made of the same kind of stone as the monument and weathered to about the same degree.

Next Mr. Kessler cemented two of these blocks together with a thin layer of mortar, in substantially the same way as the monument blocks are welded. He then placed the experimental cubes in a giant machine with a 10,000,000-pound capacity.

Since this was primarily a weight redistribution test, the scientist previously had cut back the joints on the blocks 1¾ inches and refilled these cut-back joints with a more elastic mortar than that used in cementing the monument together.

The test was a success! Under pressure conditions similar to those found in the monument the test blocks stood far more than the necessary strain without splitting.

In his next test Mr. Kessler cut back the joints of the experimental blocks to a lesser depth—1⅜ inches—to find the minimum depth the joints could be cut back and still not crack or split under the tremendous pressure exerted upon them. This test was also successful.

Within the near future federal experts, it is understood, will apply Mr. Kessler's new-found method of weight re-distribution to the monument itself. What they probably will proceed to do, he explains, is to re-distribute the weight of the entire lower section of the monument—from the 150-foot mark to the ground level. When the work is completed virtual assurance will be given the nation that our greatest memorial will hold together for at least a couple of hundred years without major repairs.

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For radio, auto, and electrical repairs, wiring, pots, kettles, hinges, etc. Saves many times its cost! Tear out this ad—get yours **today** at any hardware store. If your dealer is sold out, send 39c plus 11c to cover packing and postage.

SO-LO WORKS, Dept. RHM
Cincinnati Ohio

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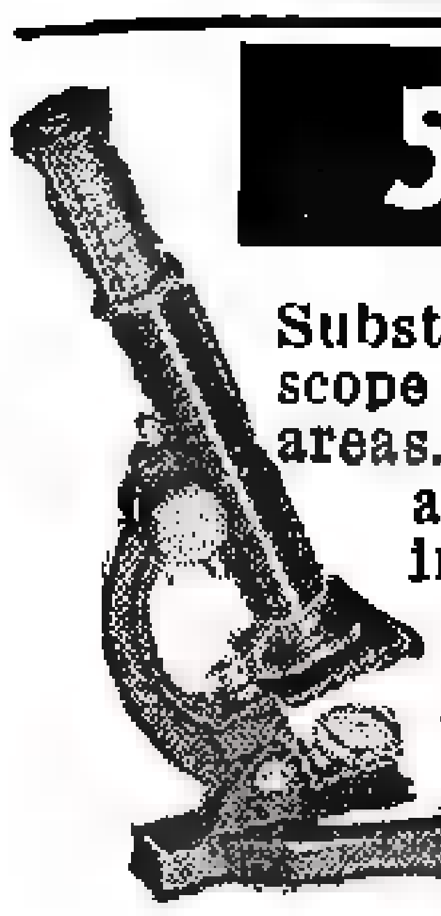
500 POWER MICROSCOPE



Substantial, American made, precise, fully adjustable microscope with powers ranging from 110 to 500X. 250,000 surface areas. Rack and pinion focusing adjustment. Microscope tilts any angle. Adjustable mirror slide clips. Height, 12½ inches. Incomparable value. Compare prices and quality and if not more than satisfied, money will be cheerfully refunded. $6.25. With Complete Dissecting Set......$7.50.

$6.25

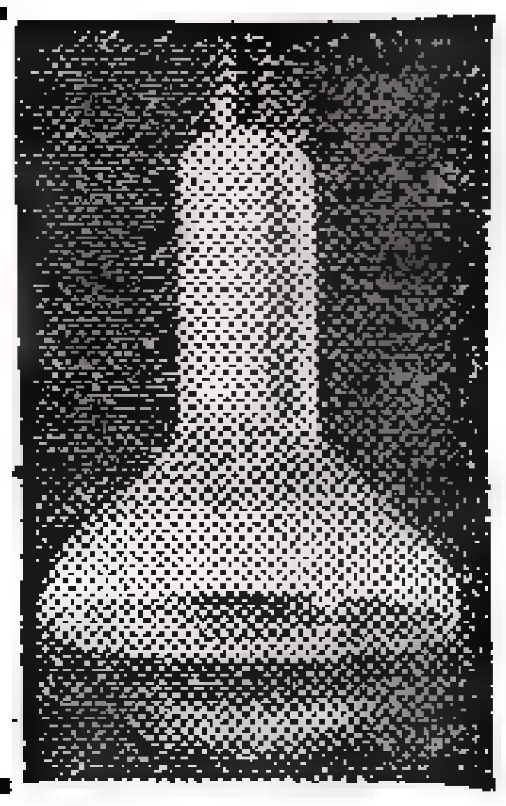
PAGO, Inc.
Dept. 57, 1095-Sixth Ave., New York

THROW AWAY YOUR SHAVING BRUSHES

Buy no more expensive shaving creams and soaps. Get the smoothest and coolest shaves you ever had, at no expense. No mussy lather to get on your hands while shaving, and make the skin slippery. The secret of a clean, close shave is to stretch the skin. This cannot be done with lather on the face, therefore my method of shaving is the secret of a perfect shave. Once let a man shave with my method and never again will he shave any other way. Why should he, when each year he is saving several times what my instructions cost him. I was a Barber over thirty years before I stumbled upon this clean, quick, smooth way of shaving. Personally I never shaved any other way since. Send $1.00 money order, your name and address plainly written, and receive full instructions.

NU-WAY CO. BOX 1045 RICHMOND, CALIF.

MARVELOUS NEW LAMP CUTS ELECTRIC BILLS



100 Watt bulb gives 200 watt illumination. Guaranteed 1000 burning hours. Five sizes—50 to 200 watt.

BIG PROFIT FOR AGENTS

100 Watt lamp, reg. price $1.25, you sell for 85c. Costs you 45c. Send 25c for sample and money-making Sales plan.

Dept. GE21, MASTERLITE CO., 110 E. 23rd St., N. Y.

RAISE RABBITS FOR US

We Supply Stock and Buy What You Raise

PAYING YOU HIGHEST PRICES—Established 20 Years. Big Profits in Chinchillas, New Zealand Whites, etc. Easy to start. Big rabbit book catalog and monthly market bulletin showing prices we pay our breeders sent for only 10c. Address

OUTDOOR ENTERPRISE CO., Inc.
Box 483 NEW CITY, Rockland County, N.Y.

LEARN TO DANCE AT HOME

LEARN THE LATEST BROADWAY STEPS

LEAD AND FOLLOW Correctly, Gracefully

This new, simple method teaches you QUICKLY AND EASILY. 20 DIFFERENT STEPS FOR ALL MODERN DANCES. The modern FOX TROT. The dreamy WALTZ. LATEST TANGO. The latest SOCIETY STEPS will make you HAPPIER, HEALTHIER, MORE POPULAR. YOU'LL ENJOY DANCING. Money back if not satisfied after 10 days' trial. Don't be a wallflower. GET SOME ENJOYMENT OUT OF LIFE! Write for full particulars, without obligation, to

IRVING SCOLNICK, 147 West 42nd St., New York

Will You Trust Me?

C. M. ELLIOTT,
Secretary,
Extension Work
and Student
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Let Me Show You How I Can Help You Get a Better Job and Make More Money

In the 14 years I've been with this School, I've had the pleasure of HELPING MEN AND WOMEN of all ages solve their all-important problem of how to get better jobs and make more money. And HUNDREDS of them have thanked me for showing them the way to success.

What Salary Do You Want?

A JOB MEANS WORK—but what kind of work, depends on you. YOU SET YOUR OWN SALARY when you pick your job. If all you can do is lift and carry—use your hands and feet—you'll have to be content with what that kind of work pays. To EARN REAL MONEY, you must be able to do work that every Tom, Dick, and Harry can't do.

I'll Help You Get a Good Job

If you will trust me—I'll tell you just how you can get the BIG-PAY JOB YOU REALLY WANT. What's even better, I'll help you get it. Part of your spare time is all that's necessary. Our selective EMPLOYMENT SERVICE will help you cash in on your training just as soon as you get it—no extra charge.

Your request for my help will also bring you a list of THOUSANDS OF STUDENTS AND GRADUATES from all over the country, who have volunteered to let us give them as local references. Any one of them will be glad to give you first-hand information about how we helped them. You will be surprised to learn how a little TRAINING WILL BOOST YOU out of "any old job" up to a good position with a future.

American School
The University of the Home

Dept. G-523 Drexel Ave. at 58th St. Chicago

Mr. Elliott: I should be glad to have you explain how you will HELP ME GET A GOOD JOB in the line checked X below. Also send me list of your local student and graduate references whom I may write, phone, or call upon if I so desire. No obligation.

—Architecture & Building
—Automotive Engineering
—Business Management
—Higher Account'g (C.P.A.)
—Salesmanship
—Drafting & Design
—Electrical Engineering
—Civil Engineering
—Highway Engineering
—Complete Law
—Mechanical Engineering
—High School Course

Name.. Age........

Address ....

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Own the snappiest boat afloat!

. . . the 20 lb. nonsinkable MEAD "KI-YAK"! You can assemble it in 3 days from our complete cut-to-fit Kit, for only $15.75 F.O.B. Factory, *2-seater—$19.50.* (Complete Sailing Rig a few dollars extra.) Are you going to "hang around" on shore this Summer, or are you going to have the envy of all your friends by owning this graceful, speedy, seaworthy craft? *Rush* 10c for new colored, illustrated circular and Free $6 Paddle Offer!

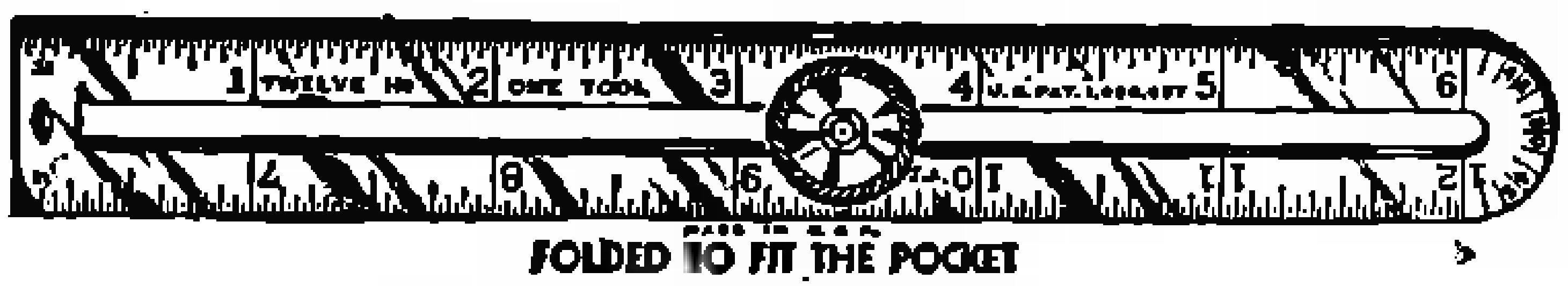
$6 PADDLE GIVEN

A beautiful, 8-foot double-blade Paddle now given with your Ki-Yak—*if you hurry!*

A new Sport Thrill for YOU!

MEAD GLIDERS 12 S. MARKET STREET
Dept. M-5, CHICAGO

TWELVE-IN-ONE TOOL

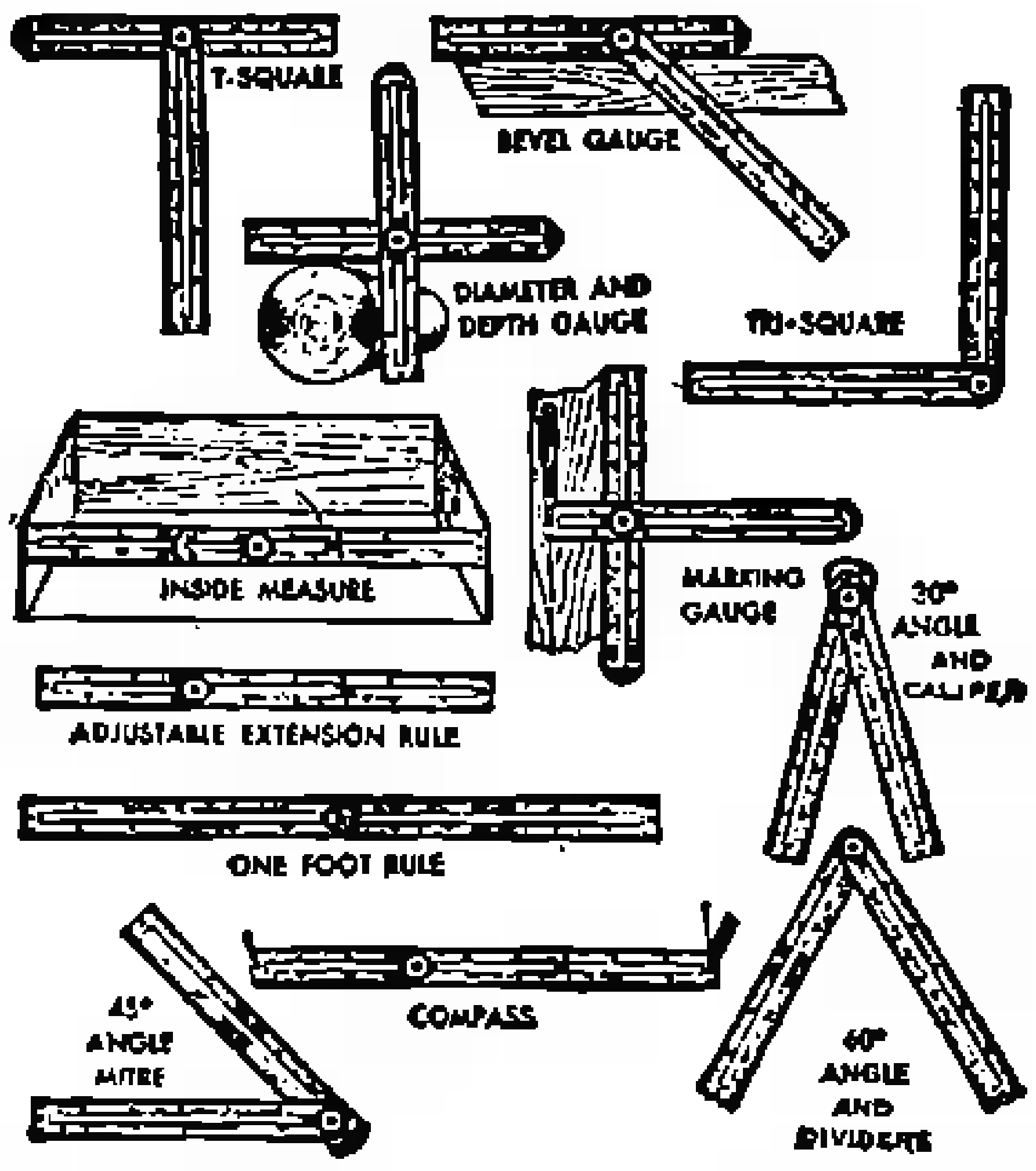

FOLDED TO FIT THE POCKET

Combining 12 tools. Accurate, economical. Made of German Silver, also Brass. Weighs [illegible] ounces. Folded 6⅝ inches long. Fully extended 1 foot.

CRAFTSMEN,
ARCHITECTS,
ENGINEERS,
MANUAL TRAINING SCHOOLS,
MECHANICS
and others need it.

Distributors wanted.

Send 50c for Sample Tool



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CHEAPER TENNIS FOR YOU—

EARN REAL MONEY, TOO!

New, amazingly simple device NOW enables **anyone** to re-string tennis racquets at big **savings** or for BIG PROFITS! **Write today** for FREE details and Catalog of tennis equipment.

H. E. WILLS CO.
1047 W. 47th St., Dept. 23-55
Chicago

Buy real **"FACTORY FRESH" GUT** strings direct-from-factory-to-you at LOW cost. Silk strings, too, **Write!**

MAKE MONEY

At Home!

EARN steady income each week, working at home, coloring photos and miniatures in oil. Learn famous "Koehne Method" in few weeks. Work done by this method in big demand. No experience nor art talent needed. Many become independent this way. Send for free booklet, "Make Money at Home."

NATIONAL ART SCHOOL, Inc.
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PSORIASIS ECZEMA

Is it necessary to suffer from these skin disorders? New wonderful ointment now relieving many stubborn cases. Try it no matter how long afflicted. Write

EDWARD KLOWDEN, Room 108, 519 N. Central Park **CHICAGO, ILL.**

HIGH POWERED TELESCOPE

$1.98

Genuine Brownscopes at Amazing Prices. Most powerful in America for the money! 15 power long range telescope. Can see moon's craters or time on pocket watch a block away. 5 sections. Approx. 3 ft. long. Fine lenses. Brass bound. Can be used as powerful microscope vol. magn. 512X. Only $1.69 postpaid! C.O.D. 34c extra.

$1.69

Special Super Power 30X Telescope. Similar to above but more powerful, guaranteed to see 900 times larger in surface and 30 times closer. 31mm objective. 4 powerful lenses. Large field. Includes powerful microscope feature. Only $1.98 postpaid.

BROWNSCOPE CO., Dept. X-15, 246 Fifth Ave., N.Y.

The U.S. AIR CORPS

Takes in this year 600 unmarried men between ages of 20 and 28 and gives them FREE FLYING TRAINING consisting of 200 SOLO HOURS, including cross country and night flying. Gives them Special Uniforms, Traveling Expenses to Field, Living Expenses, and pays each man $75 a month. The course takes one year. It costs Absolutely Nothing. Let us tell You: How to Get In; Information about System, Leave, and Actual Life at the New $10,000,000 Field. Send your Name. Hand postman $1 and postage when Information comes. It is COMPLETE. Nothing else to buy.

Flying Intelligence Bureau, [illegible] Jud N. Rives Bldg., Los Angeles, California

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ASTHMA HAY FEVER BRONCHITIS

SUFFERING OVERCOME—*Quickly, Safely!*

Ama-Gon, amazing new California home treatment, quickly stops Asthma, Bronchitis, Hay Fever suffering. Absolutely **SAFE** for young or old. No matter how many remedies you have tried, Ama-Gon quickly overcomes that awful wheezing, choking sensation and enables you to breathe **FREELY, EASILY** again. Promotes sound, restful sleep. We want **YOU** to prove its value to **YOURSELF WITHOUT RISKING ONE CENT**

BEFORE AFTER

Sleeps Soundly NOW!

"I suffered 15 yrs. with Bronchial Asthma," wrote Mrs. R. Chavez, 280 S. Palm St., Ventura, Calif., "Tried everything without relief. After using 1½ bottles of Ama-Gon I feel like a new person. Got rid of my wheezing and now sleep soundly the whole night thru."

ACCEPT 8-DAY TRIAL OFFER

MAIL COUPON NOW FOR FREE BOOK

AMA-GON LABORATORIES,
Dept. C-28, 1500 N. Vermont, Los Angeles, Calif.
Accept 8-DAY TRIAL OFFER, and FREE Book about Asthma, Bronchitis, Hay Fever, WITHOUT COST.
Name ....
Address ....City..................

Learn to Play Baseball From Stars

(Continued from page 45)

read of Eddie Rommel's success with it."

Good screw ball pitchers are few and far between. Carl Hubbell of the New York Giants, hero of the 1933 World Series, is perhaps the most successful of this type today. He told me:

"The screw ball is so called, of course, because it travels much in the manner of an ordinary screw being turned into wood.

"It is held the same as in the case of the ordinary pitch and thrown side-arm with a very sharp twist of the wrist with the thumb falling outward at the instant of delivery. This causes the ball to rotate from left to right as it moves in flight."

Probably the best example of a fast ball pitcher in all baseball was Walter Johnson.

Most pitchers used the overhand swing, the ball shooting downward from the highest point of the swing. Not so with Johnson, however. His slow, side-armed delivery was particularly deceptive. Batters were invariably puzzled as to why a ball could be thrown so easily and yet so fast.

The Famous Fadeaway

The fadeway was Christy Mathewson's best bet, delivered by a particularly stressing sweep of the arm, moving toward third base on the downward swing and toward first at its completion. Thrown much in the manner of the outcurve, it differs in that the palm of the hand is held downward, so that the ball slips away between the second and third fingers.

Let us now turn to the batter.

Rogers Hornsby stood in the rear and to the right of the box. He holds the highest modern batting average—.424 in 1924. Here is his explanation:

"Of course I stood as I did because it was the most natural way for me to do so. However, I found, at the same time, that by standing back and away from the plate with my feet almost together that I could have more time to study a pitch.

"Also, by standing that way I could move my left foot either forward in the direction of the plate or directly toward the pitcher. In this manner I could better prepare myself for any sort of a pitch without throwing myself off balance."

Ty Cobb needs no introduction as a hitter. Cobb was the master. Recently I discussed batting with him. He said:

"I suppose I would never be called an orthodox hitter. But I found that by holding the bat shorter than is customary and by keeping my hands apart until such time as I swung at the ball, I could maintain better control of the bat and be ready to bunt or place-hit."

No batting treatise is complete without mention of Babe Ruth, who takes his stance near the plate, feet almost together. Ruth holds his bat long, for, as he says, "By holding my bat long I find that I get more leverage for my long drives."

Spare Time Training
that helps you

Speed Up Prosperity!

DO YOU want to speed up the return of prosperity to you—insure your early and large participation in the new jobs, promotions and salary increases—get fullest benefits from the business pick-up?

You can do it.

For many months to come, individual competition in business will be tremendous. Employers—up against new problems, fighting for survival and profits—will be able to pick and choose. Naturally they will prefer the trained man—the man who has special ability to offer them.

If you wish this advantage, simply mark on the coupon the field of business in which you are most interested. We will send you full information about the opportunities in that field, tell you how our complete success-building program helps you plan your future, trains you in your spare time, and works with you all through your career. Send the coupon NOW.

Find Yourself Through LaSalle

LaSalle Extension University
Dept. 5493-R Chicago

Please send me full information regarding the success-building training and service I have marked with an X below. Also a copy of "Ten Years' Promotion in One"—all without obligation to me.

- ☐ **Business Management:** Training for Official, Managerial, Sales and Departmental Executive positions.
- ☐ **Modern Salesmanship:** Training for position as Sales Executive, Salesman, Sales Trainer, Sales Promotion Manager, Manufacturer's Agent, and all positions in retail, wholesale or specialty selling.
- ☐ **Higher Accountancy:** Training for position as Auditor, Comptroller, Certified Public Accountant, Cost Accountant, etc.
- ☐ **Traffic Management:** Training for position as Railroad or Industrial Traffic Manager, Rate Expert, Freight Solicitor, etc.
- ☐ **Law:** LL. B. Degree.
- ☐ **Banking and Finance:** Training for executive positions in Banks and Financial Institutions.
- ☐ **Modern Foremanship:** Training for positions in Shop Management, such as that of Superintendent, General Foreman, Foreman, Sub-Foreman, etc.
- ☐ **Industrial Management:** Training for Works Management, Production Control, Industrial Engineering, etc.
- ☐ **Personnel Management:** Training for Personnel Manager, Industrial Relations Manager, Employment Manager, and positions in Employee Service.
- ☐ **Modern Business Correspondence:** Training for Sales or Collection Correspondent, Sales Promotion Manager, Mail Sales Manager, Secretary, etc.
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Ten years promotion in one

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*Present Position*________________________

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Actually Put Photos
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Print Favorite Snapshots or Portraits on Handkerchiefs, Ties, Pillows, Scarfs, Table Covers, Loving Cups, Dishes, Novelties, etc.

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newest product of photographic science gives perfect, rich black and white photo reproductions on cloth, metals, etc. Very simple to do. No equipment required. Full instructions with each bottle. Enough for 60 pictures. $1 postpaid.

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prints pictures on cloth only, in beautiful, clear brown tones. Satisfaction positively guaranteed. One bottle makes 25 pictures. **Postpaid for 45c** with full instructions.

MAKE INVISIBLE PHOTOS WITH LEROIMYSTIC

Loads of fun making invisible photos. Simply swab any photograph with Leroimystic and picture instantly disappears. Then, rub with wet finger, and Presto! Picture snaps right back. Big bottle makes about 100 invisible photos. **Postpaid for $1.**

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Thousands of items offered at real bargain prices. Lists imported and domestic photo equipment and optical goods of all kinds at tremendous savings. Sent with any item described above or FREE for the asking. Write

CENTRAL CAMERA CO.
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MAKE $ $ $ MONEY
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Quickly and easily learn the science of collecting money for business men, merchants, doctors, etc.; no capital or canvassing necessary. Big opportunity everywhere. Write for FREE details.

COLE & ASSOCIATES
Dept. CM State Tower Bldg. Syracuse, N. Y.

AVIATION

Aviation depends upon engines, and expert knowledge of aviation engines is a long step toward success in this rapidly growing industry. International Correspondence Schools offer you a modern, complete course of instruction in aviation engines, covering fully every feature of this important subject. Mail the coupon!

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Send me—*free*—your booklet on aviation and complete information on subject checked below:

☐ Aviation Engines
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Name..

Address..

HYPNOTISM

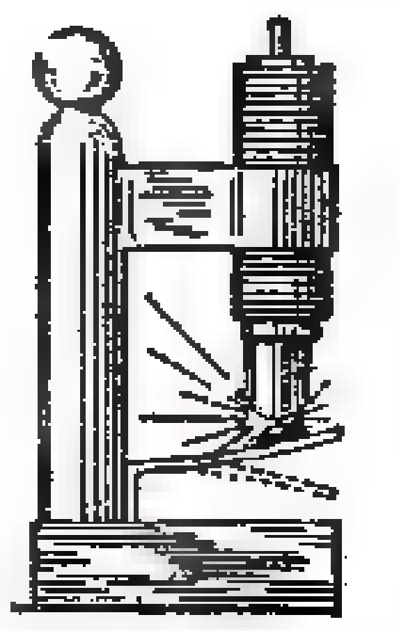
Learn the Secrets of this MYSTIC POWER

Hypnotism is a strange, subtle power that gives you the key to the Inner Secrets of Mind Control. When this mighty power is released, you can overcome all obstacles; make people obey your commands; strengthen your memory; develop a strong, magnetic personality; realize your ambitions; banish fear and worry; increase your salary; and become master of yourself, friends and acquaintances—either sex. These magic secrets are now revealed in 265-page book—"The Science of Hypnotism."

This marvelous book explains the theory and practice of Hypnotism; gives 9 stages of Hypnotism; tells how to select subjects, how to hypnotize at a glance; discusses mesmerism, magnetic healing, mental telepathy. Most complete book published.

SEND NO MONEY Just send your name and address. We'll ship book at once. Pay postman only $1.98, plus postage. Satisfaction guaranteed.

Franklin Pub. Co., 800 N. Clark St., Dept. 1705, Chicago



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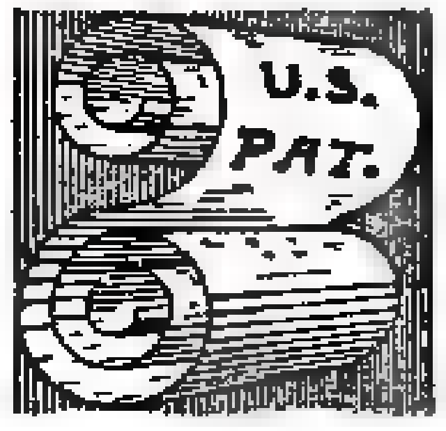
Electric Fun! Make toy motors, buzzers, tops, machine guns, arcs, shockers, lights obedient to the voice, window novelties, floating rings, spirit rapping—all kinds of amusing and practical electrical devices. Our book gives full directions for doing 200 stunts with 110 volts, A.C. Price postpaid $1.00.

CUTTING & SONS 54-D St. CAMPBELL, CALIF.



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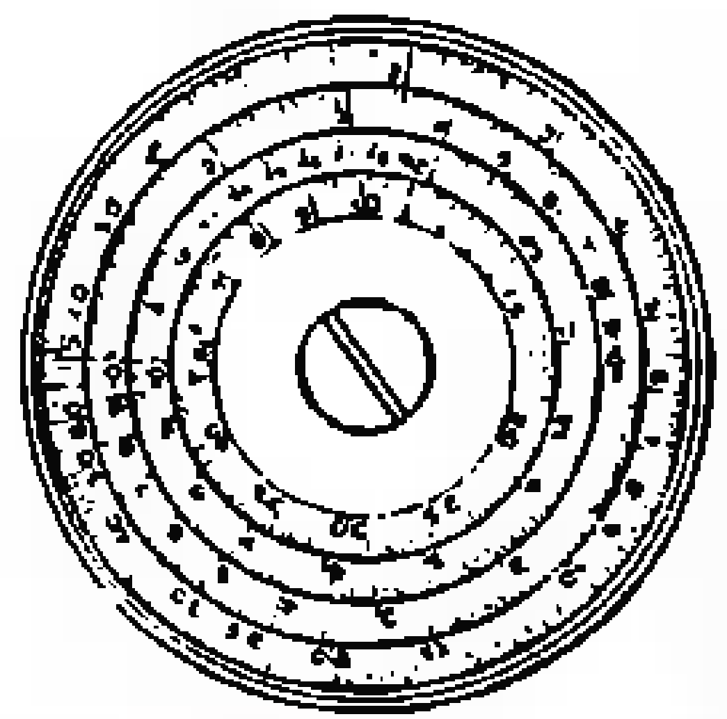


The TASCO Slide Rule
Will Soon Pay for Itself

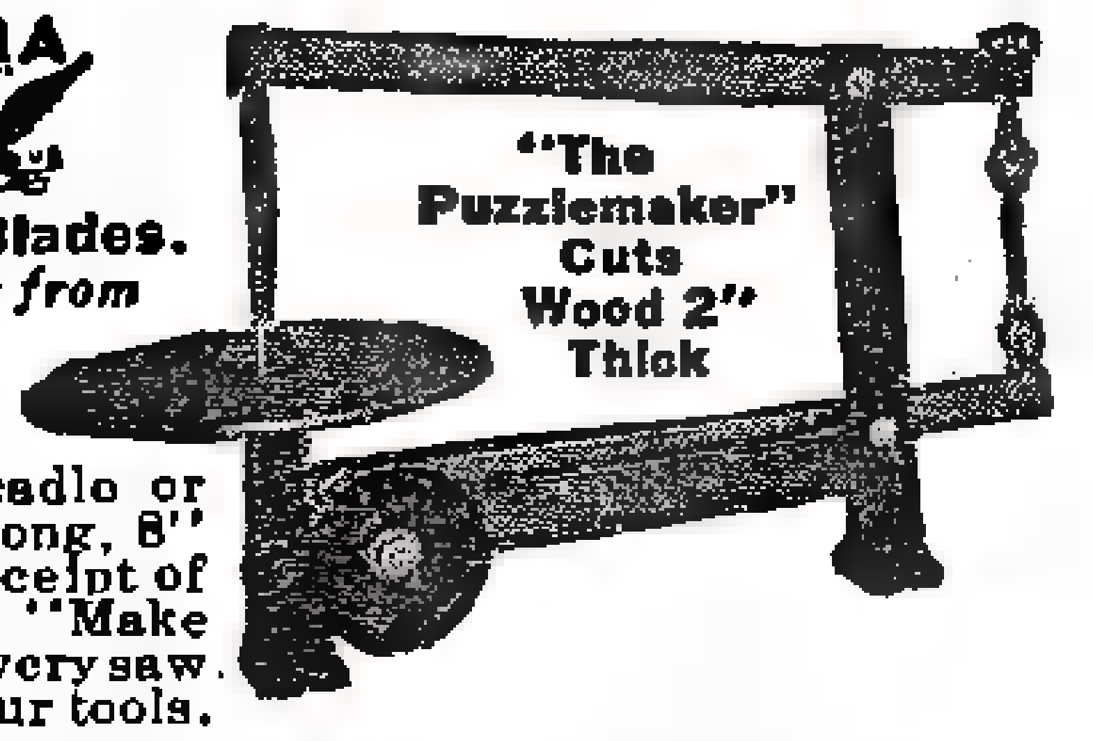
These rules surpass all other pocket rules—Can be carried in vest pocket—light in weight but always accurate—all metal construction—grease and waterproof, also indestructible. With a TASCO Slide rule the reading is never off the end of the scale. Low Priced and Built like a Watch. $5.00 cash or C. O. D. Catalog free.

TAVELLA SALES CO. 23 West Broadway, New York

GUARANTEED
ALUMINUM SOLDER

New Improved Aluminum Solder **ALUMASOD** makes soldering aluminum, sheet or cast, as easy as soldering tin. Special $3 kit now offered for only **$1**. Manufacturers and repairmen demand it. Local distributors wanted. **Send $1** for introductory offer and full particulars. **INDUSTRIAL SOLDERS CO.** Dept. E, 5410 Wilshire Blvd., Los Angeles, Calif.

SOLD ON A MONEY BACK GUARANTEE



$1.50 JIG SAW

NRA

Plus Adapters and 12 Assorted Saw Blades. *Adapters enable you to use any type blade from coarse to very fine.* **NEW FEATURE!** hardened steel grooved roller saw-guide formerly found only on most expensive machines. Saw has V-pulley for treadle or motor. All metal construction. 15'' long, 8'' high, 6 1-2'' table. Sent postpaid on receipt of $1.50, outside U. S. A., $1.75. Booklet "Make Your Own Jig Saw Puzzles" given with every saw. Send 3c stamp for folder describing all our tools.

"The Puzzlemaker" Cuts Wood 2" Thick

J & H METAL PRODUCTS CO 480 St. Paul Street, Rochester, N. Y.

FREE RADIO CATALOG

1934 RADIO CATALOG

Write for our new catalog . . . most complete line of latest radio sets, service men's supplies, replacement parts at lowest wholesale prices.

ALLIED RADIO CORPORATION 833 W. Jackson Blvd. Dept. B, Chicago

SEND FOR FREE COPY OF MODERN MECHANIX BLUEPRINT BOOKLET.

OWN a Business

We Help You Get First Customers!

We are selecting a few more honest, dependable men to establish in their own business—*guaranteed* mothproofing and furniture reviving and cleaning. No experience. *Easy to learn.* Join this nationwide chain of franchise owners earning $4 to $9 from each hour of servicing. Everything furnished—electric machines, advertising demonstrators, etc. Short hours—large profits.

No Shop Required

Work is done in homes, offices, schools, hotels, theaters, hospitals, clubs, lodge rooms, churches, institutions, etc., and for apartment owners and auto-dealers by you or your service-men. Profit on both materials and labor. Clean, disinfect, and **revive** furniture, auto upholstery, etc. Original colors return. Nap again stands erect and even. Upholstery, rugs, furs, clothing, blankets, piano-felts, auto interiors, etc., are made **non-eatable by moths or carpet beetles** by patented process to which our franchise owners exclusively have rights. Method successful 12 years. U. S. Government reports, "Moths are present in practically every household."

We Advertise For You

The H-S-C sales plan is based upon **bringing customers to you** and getting invitations to come to them. Business grows steadily through customers' recommendations. W. A. Looklebill writes, "Got 2 orders from ladies watching job." R. W. Johnson's first job brought another. The coupon below will bring full details.

Others Earn Up To

$90 a Day

K. Anderson writes, "I earned $90.00 clear one day. Most of my business comes through store-cards, folders and voluntary repeat orders."

W. Miller writes, "Have already done 25 jobs and have interested nearly 100 prospects."

E. N. Hargrave writes, "We have a large variety of customers including hospitals, theaters, clubs, apartment buildings, offices, stores and auto-dealers. We get new customers through folders, store-cards, our 12 canvassers, etc., but our steady and frequent repeat orders are building our business."

W. Tesnow writes, "My first day, I took in $104.00. Had $88 net profit. Rejuvenating does beautiful work."

A. W. Carter's first job from his circulars amounted to $79.60.

Here is an opportunity for honest, dependable men.

A Life Income

HOME SERVICE CO., 175 Dr., Racine, Wis.

Tell me in detail how I may have a life income in a business of my own built upon satisfied customers.

Name ....

Address ....

City .... State..........

REPEAT and VOLUNTARY orders build a life-time business **founded upon satisfied customers.** As little as $77 puts you in OWN business—pay balance from profits. **We do advertising for you and furnish enough materials with equipment to return TOTAL investment with a large profit.**

MAIL COUPON TODAY
WHILE TERRITORY IS OPEN!

WANT A STEADY JOB?

TRAVEL for "UNCLE SAM"

STOP
LOOK
LISTEN
U. S. MAIL
UNITED STATES MAIL
RAILWAY POST OFFICE
1100

MANY OTHER U. S. GOVERNMENT POSITIONS
STEADY WORK

MEN—BOYS 18 TO 50

Short Hours — Pleasant Work
Rapid Advancement — Permanent Employment

MANY EARLY EXAMINATIONS EXPECTED.

MAIL COUPON TODAY. TOMORROW YOU MAY FORGET.

VALUABLE COUPON

FRANKLIN INSTITUTE, Dept. B-299, Rochester, N. Y.

Rush to me entirely free of charge: 32 page book, with list of U. S. Government Jobs and particulars telling how to get the job here checked.

...Railway Postal Clerk	($1900-$2700)
...Post Office Clerk	($1700-$2300)
...City Mail Carrier	($1700-$2100)
...Rural Mail Carrier	($2100-$3400)
...Inspector of Customs	($2100-$3300)
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Name..

Address..

50c
5-month sub.
(Formerly $1.25)
Foreign 50% Extra

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SUBSCRIBE NOW!

$1.00
1-year sub.
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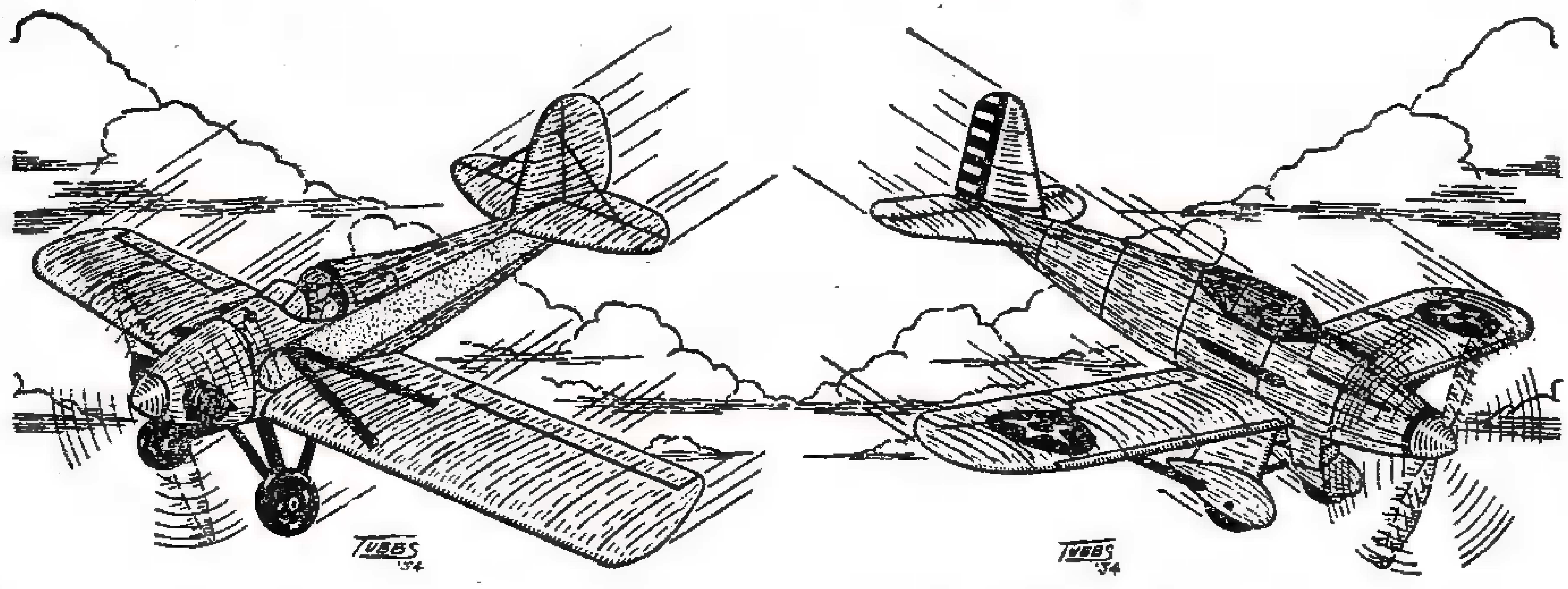
FOR BUILDERS

"The Amateur's Tabloid Aviation Journal"



Here you are, boys! What readers asked

SPORTSMAN AVIATION

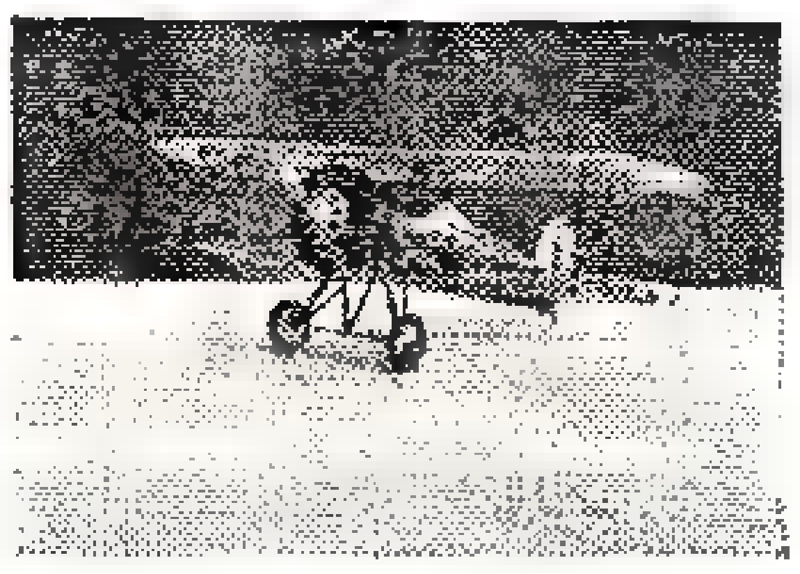
to give them is now ready. Just what you, too, have been waiting for. A real true honest-to-goodness lightplane of good design, simplicity and low-cost.

OUR S-A "MOTH"!

A one-place low-wing lightplane which every amateur will dream about! Powered with the highly successful LONG 35 h.p. Harlequin Twin. Can be built for $350.00 or less. An enclosed cabin is optional. Its perfect balance assures stable flight with utmost safety. And a speed-range almost unbelievable.

Specifications:

Span	30 ft.
Chord	4 ft.
Airfoil curve	Clark Y-15
Length	17 ft. 6 in.
Height	4 ft. 6 in.
Weight light	350 lbs.
Weight loaded	575 lbs.
High speed	100 m.p.h.
Cruising speed	85 m.p.h.
Landing speed	25 m.p.h.



FREE Drawings and Membership with Every 1-year $1.00 Subscription!

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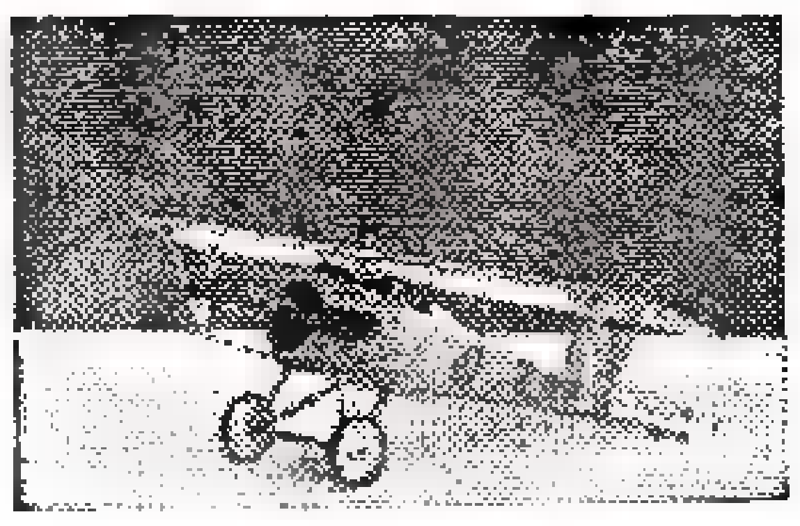

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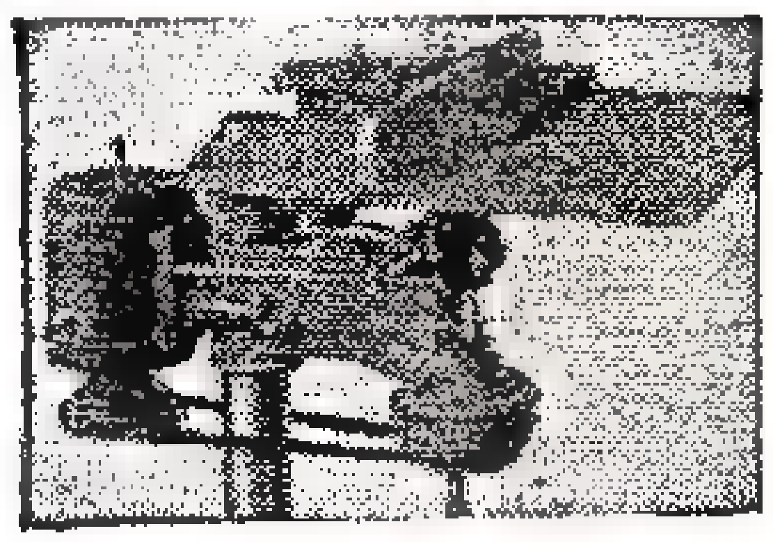

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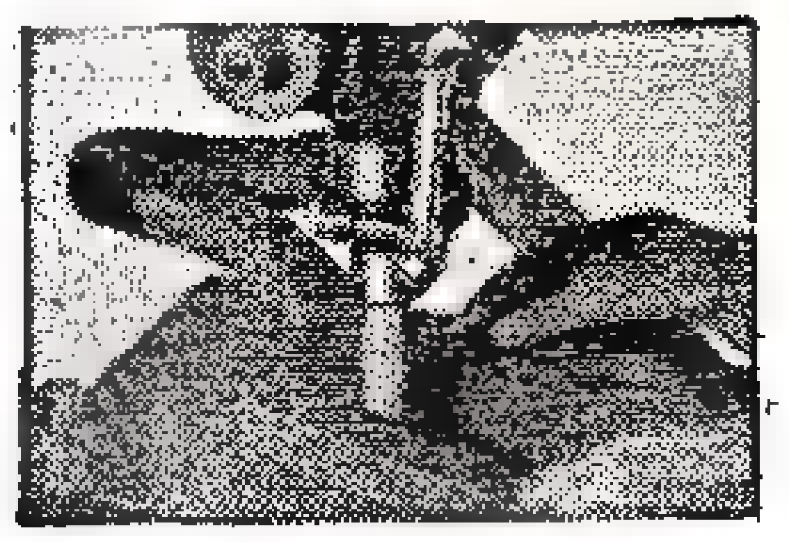

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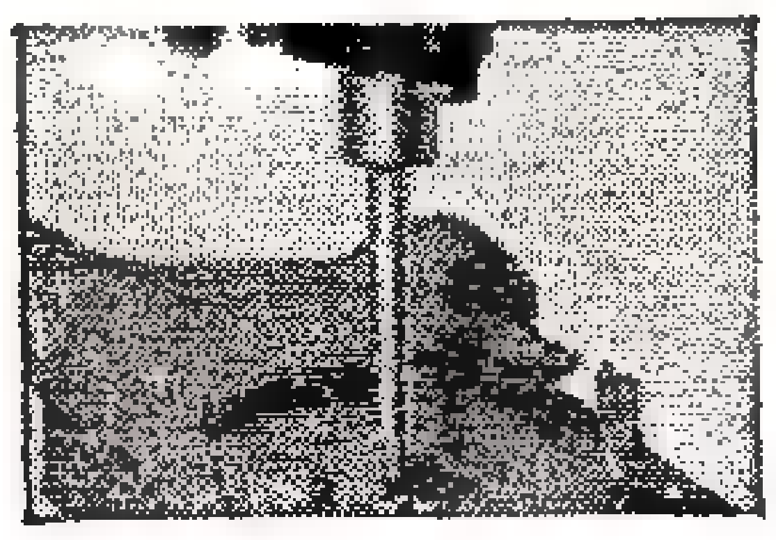

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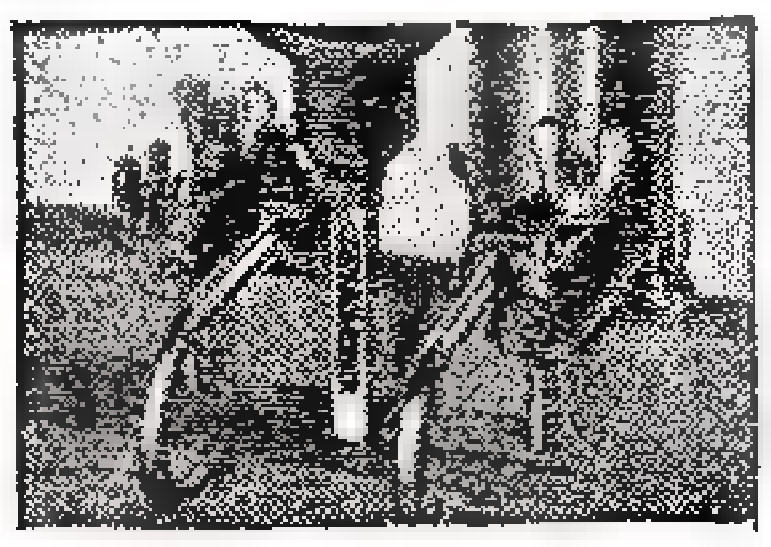

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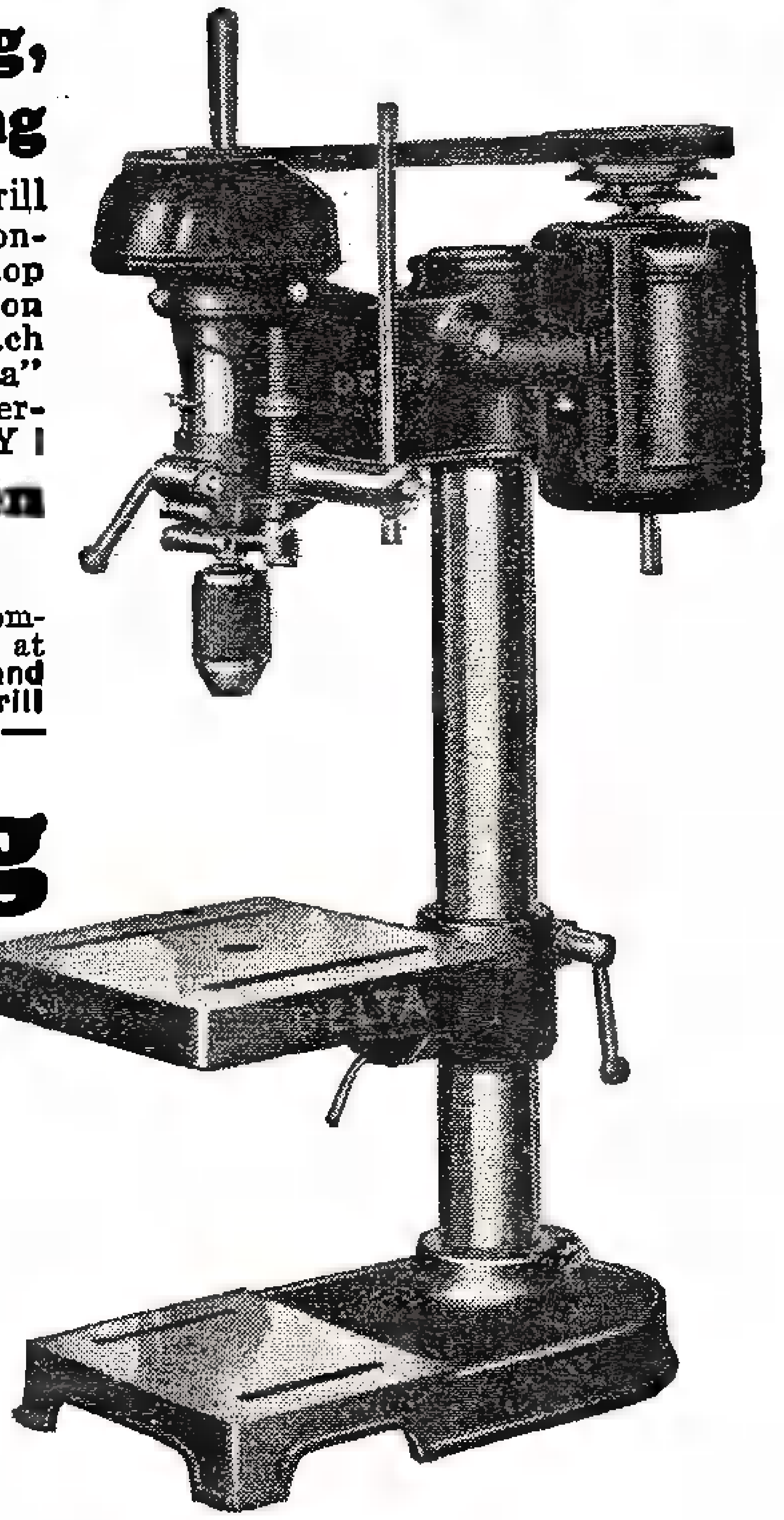

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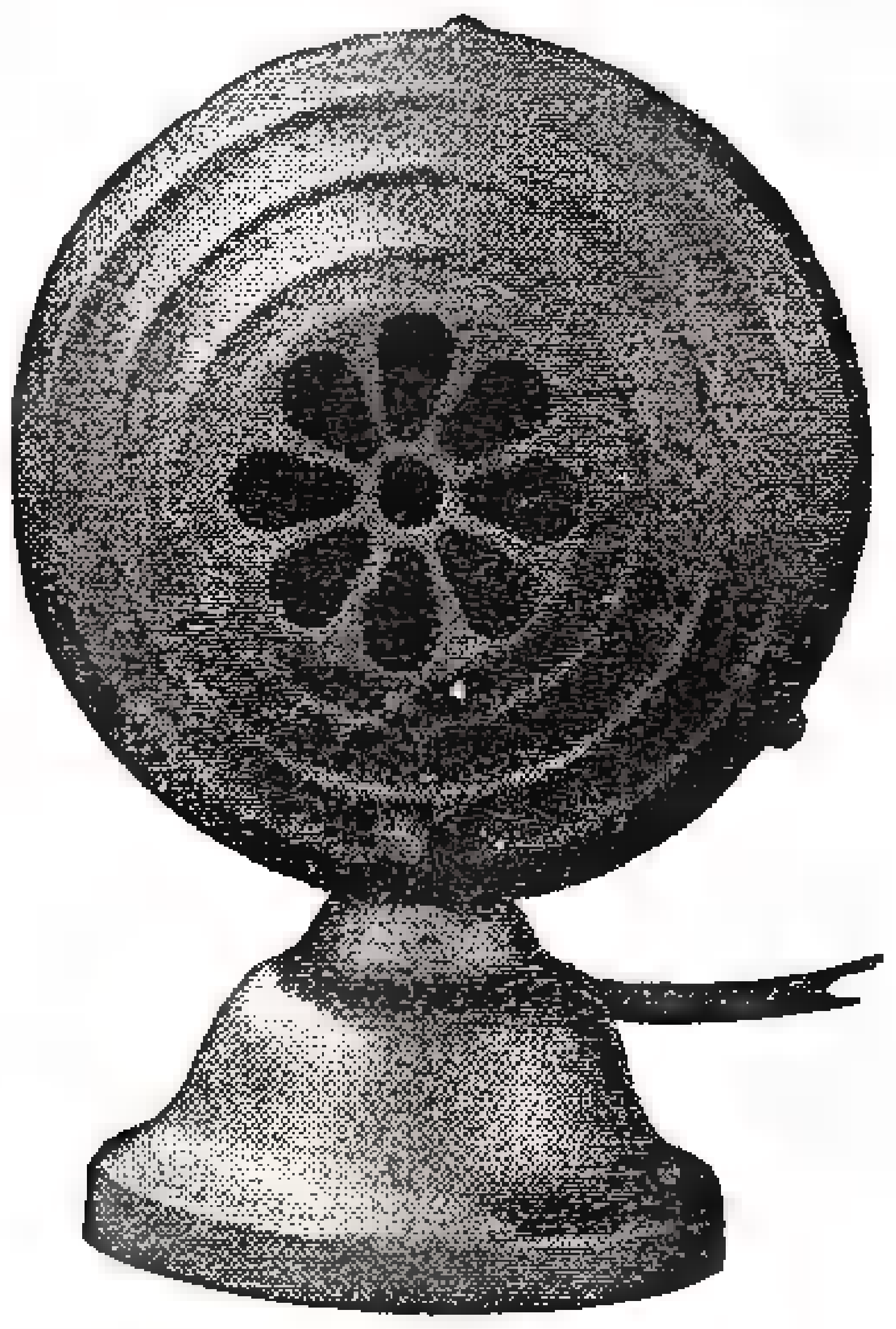

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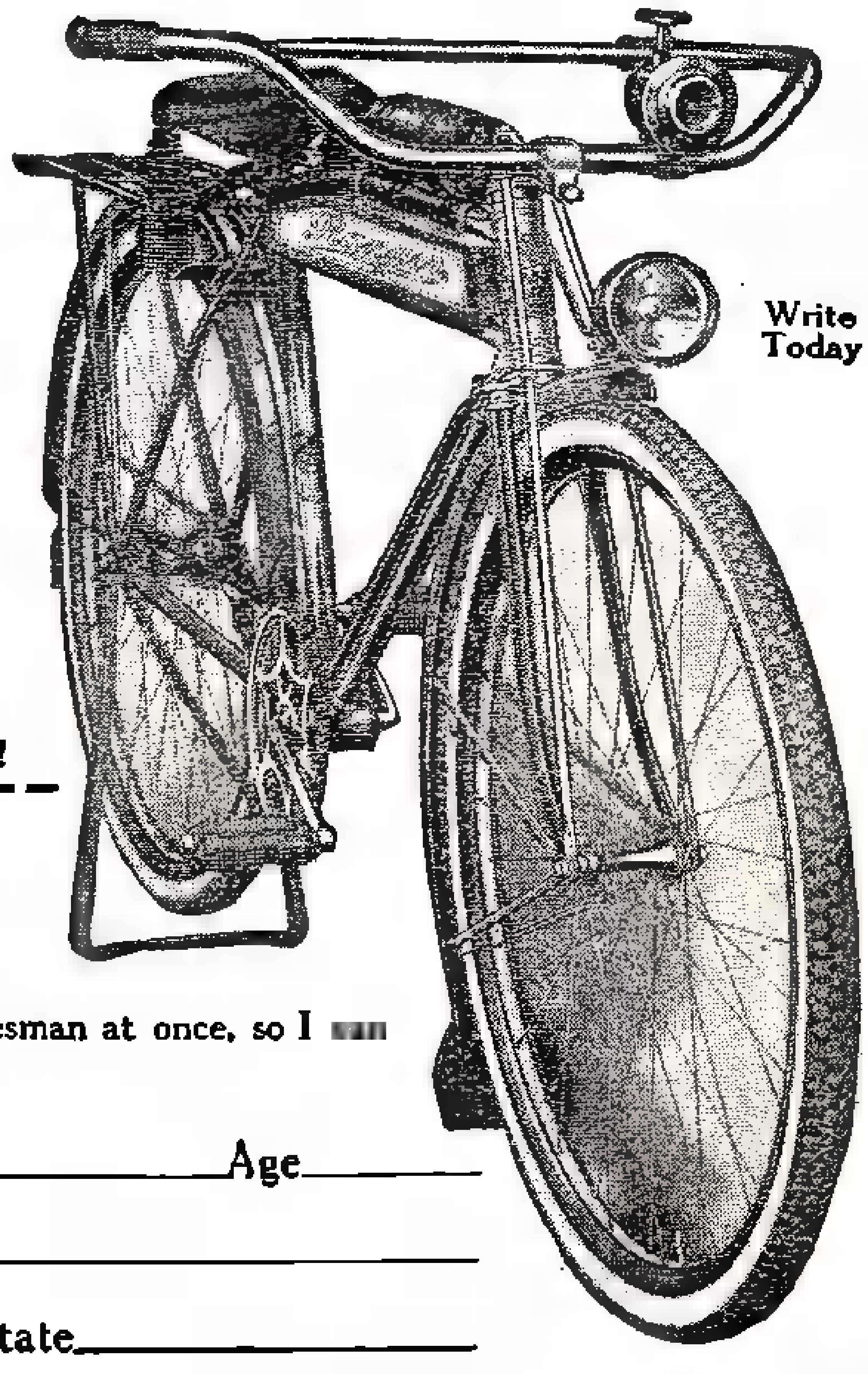

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29x5.25-19	2.95	1.15
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31x5.25-21	3.25	1.15
28x5.50-18	3.35	1.15
29x5.50-19	3.35	1.15
30x6.00-18	3.40	1.15
31x6.00-19	3.40	1.15
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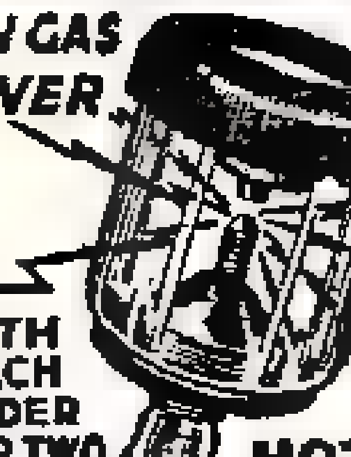

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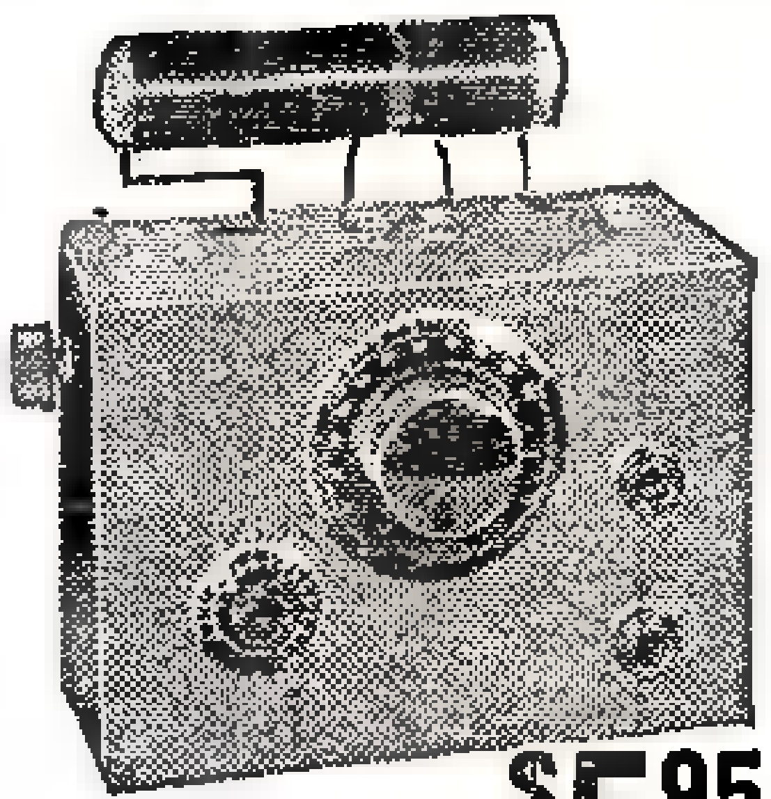

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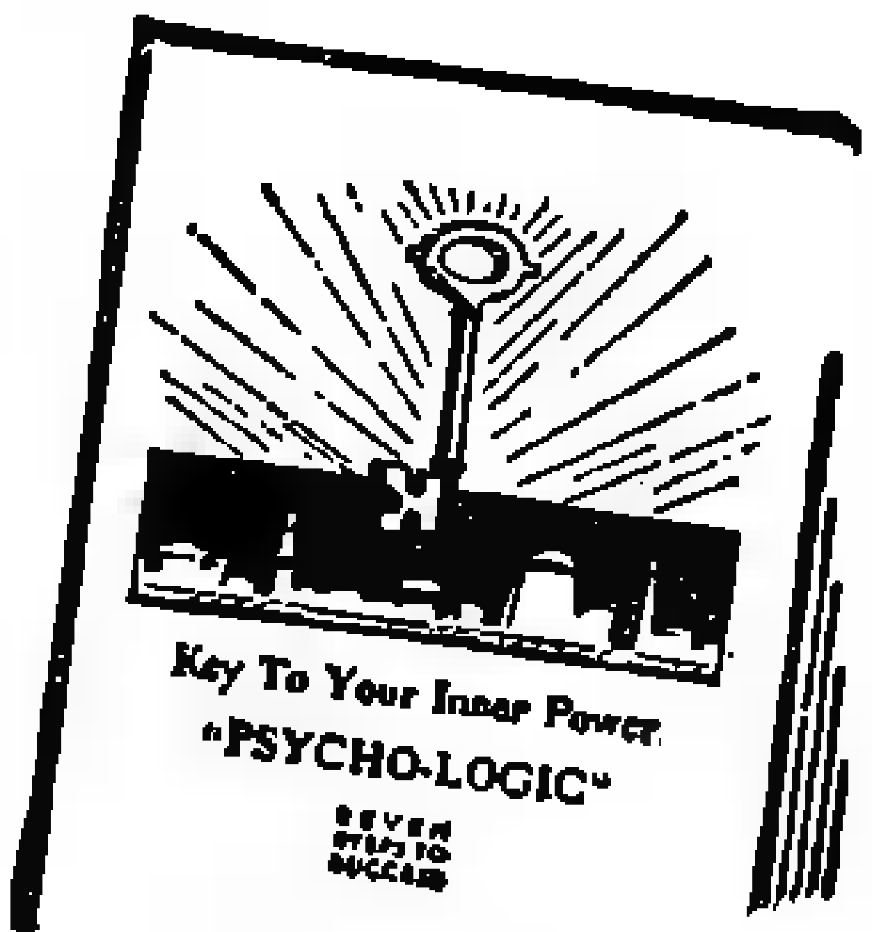

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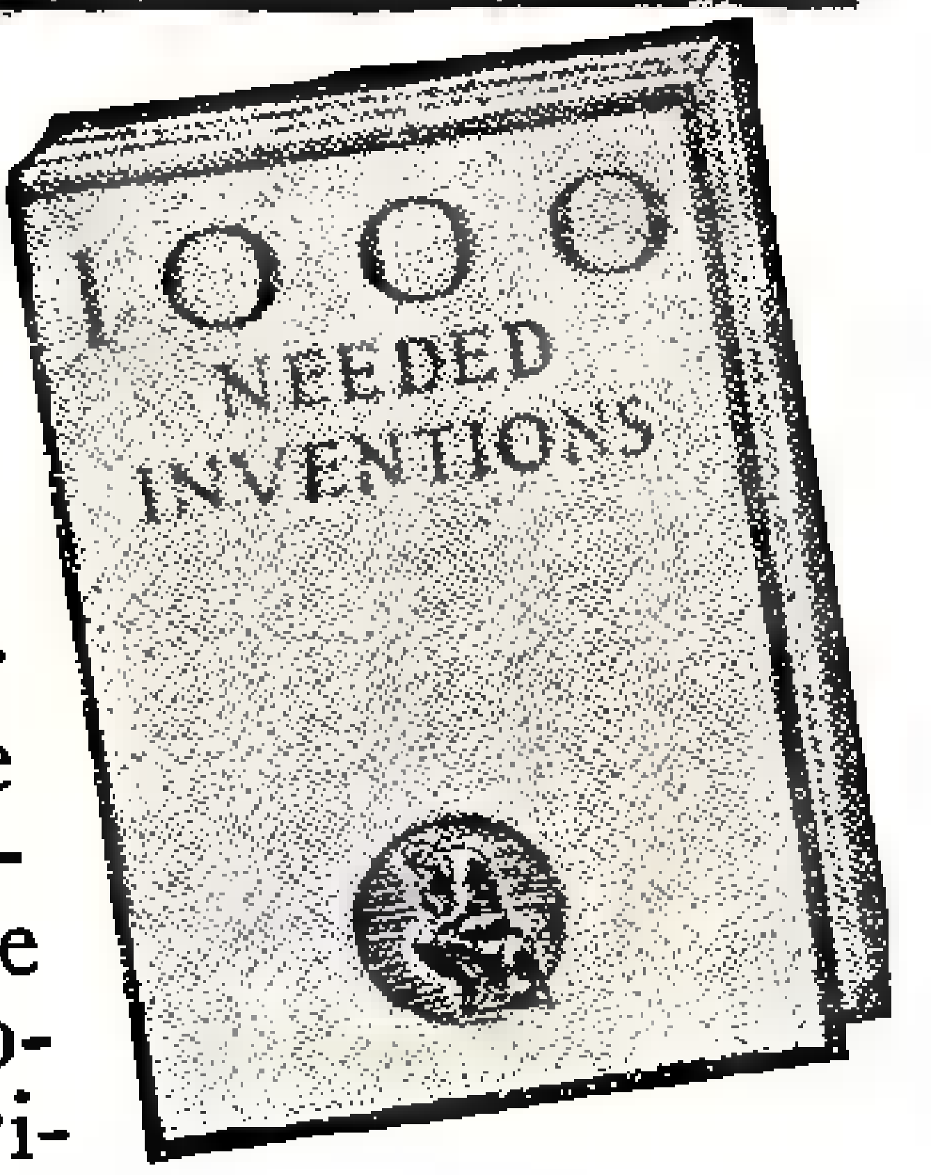

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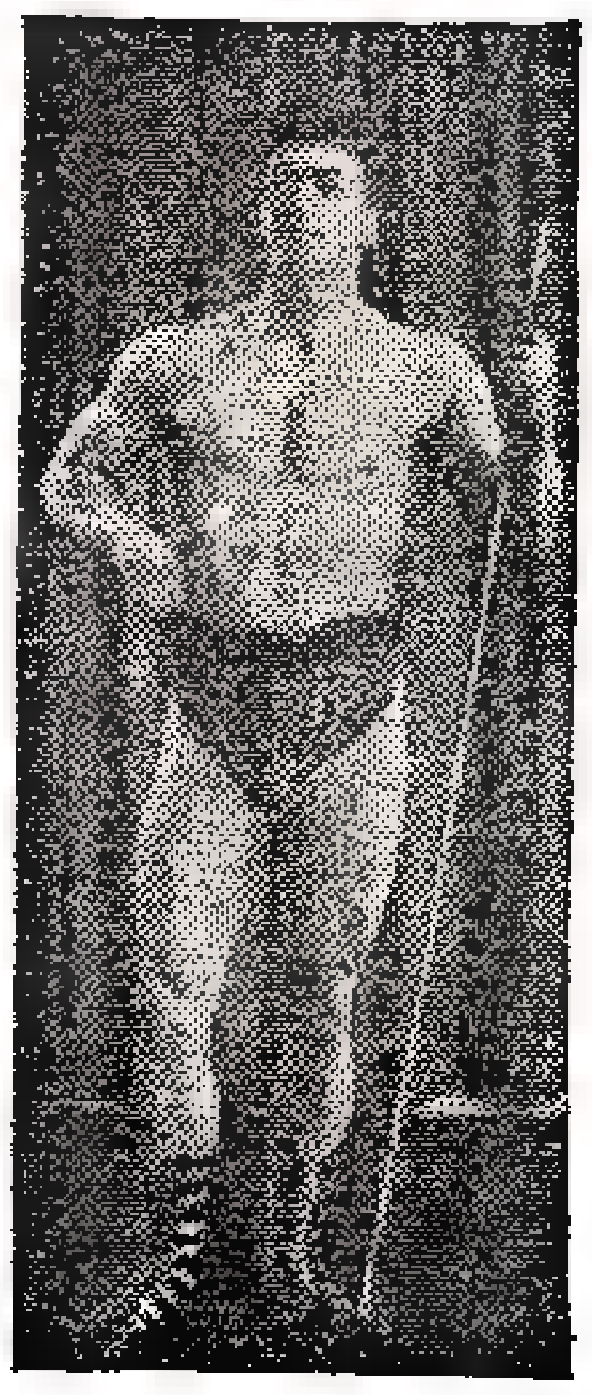

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Fortunes Await Needed Inventions

(Continued from page 88)

the happy solution has yet to appear.

Summer is just around the corner and the writer wonders if inventors have ever given the common window screen a thought. Surely if much thought had been given the subject we should today have a screen that is adjustable in two dimensions in place of one. In other words why not a screen that can be widened and lengthened at the same time so that the amount of fresh air coming into a window can be regulated?

Who can invent a kitchen table and ironing board combined? You simply swing the top of the table back and down and up pops the ironing board all ready for use.

Crashing Airplanes for the Movies

(Continued from page 40)

Suppose, for instance, the director calls for three pilots to fly close by the camera ship, move into a "griddle stack," (three planes one above the other with no more than two feet between landing gear and wings) and break out quickly.

Frank Clark, whose favorite stunt is landing from a spin, takes the top plane. Roy Wilson (later killed while attempting such a stunt) goes into middle position. Gordon flies the bottom ship. With perfect timing, in smooth air, the three ships come together, the lower planes flying up against the bellies of those above.

Now to break away. After three minutes in front of the camera, the order is signalled for the breakup. Clark barrel-rolls up and out of the picture; Wilson flies straight ahead and dives, while Gordon sticks his nose down and slips out to the right, away from the cameras. Perfect timing and a perfect shot!

Difficult though that maneuver may be, horizontal "crashes" require more nerve and cool-headed flying than any other. Picture this scene: Two airplanes are flying wing-to-wing when suddenly a third ship crashes head-on with the plane nearer the camera. Of course pilots and valuable planes are not sacrificed. The camera "cuts" at the moment of seeming impact and miniatures provide the real crash. But the preliminary action is real and fraught with danger.

The secret lies in the angle of the cameras which stare upward at an angle of 45 degrees. Thus the outside plane, to be properly in line, flies at a slightly higher altitude than the nearer ship. The third plane, flying head-on, takes the altitude of the outer plane. They approach. When the engines are within thirty feet of each other, the outside pilot pulls sharply upward and the approaching pilot continues his line of flight, passing twenty feet from the wings of the inside plane. Thus they appear at this moment actually to collide. If this maneuver is performed 700 feet distant from the cameras, the collision will occupy 10 frames of film, representing eight hours of effort and a cost of almost $3,000! Of such tedious work are air thrillers manufactured.

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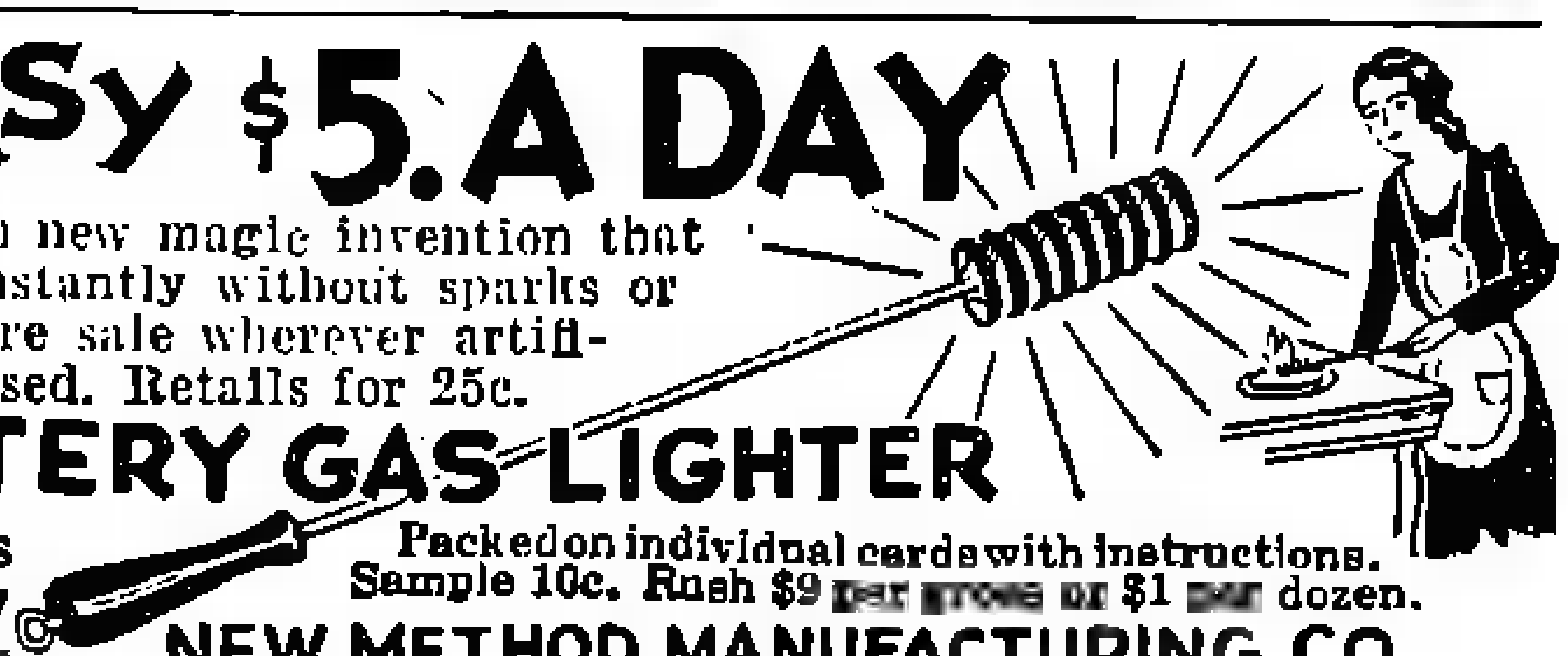

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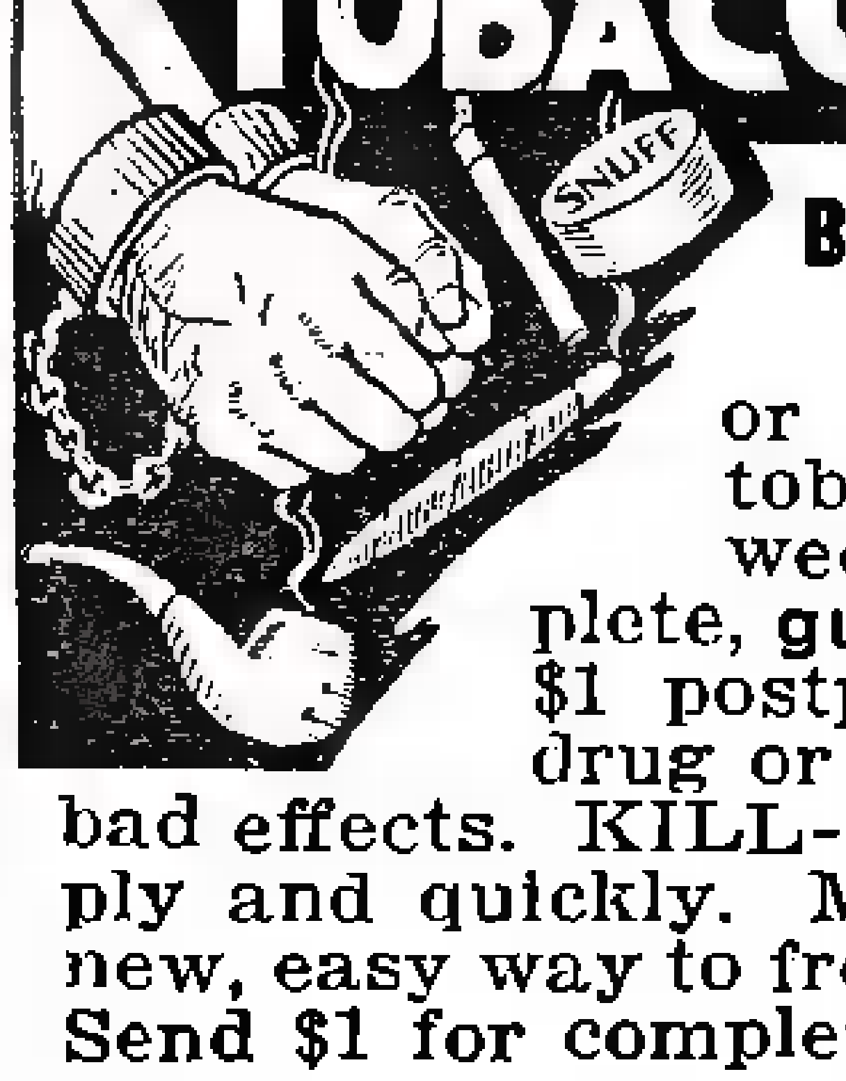

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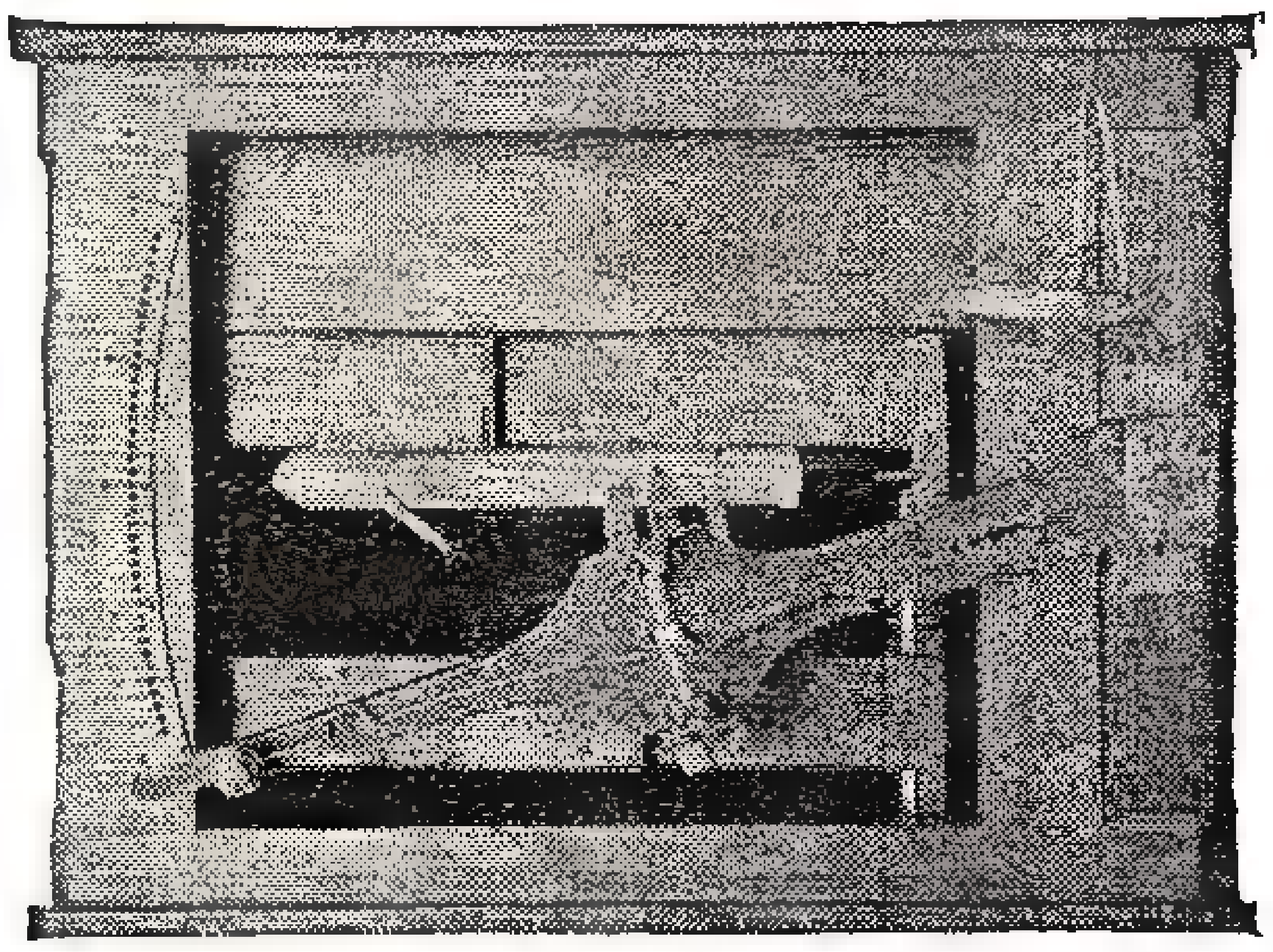
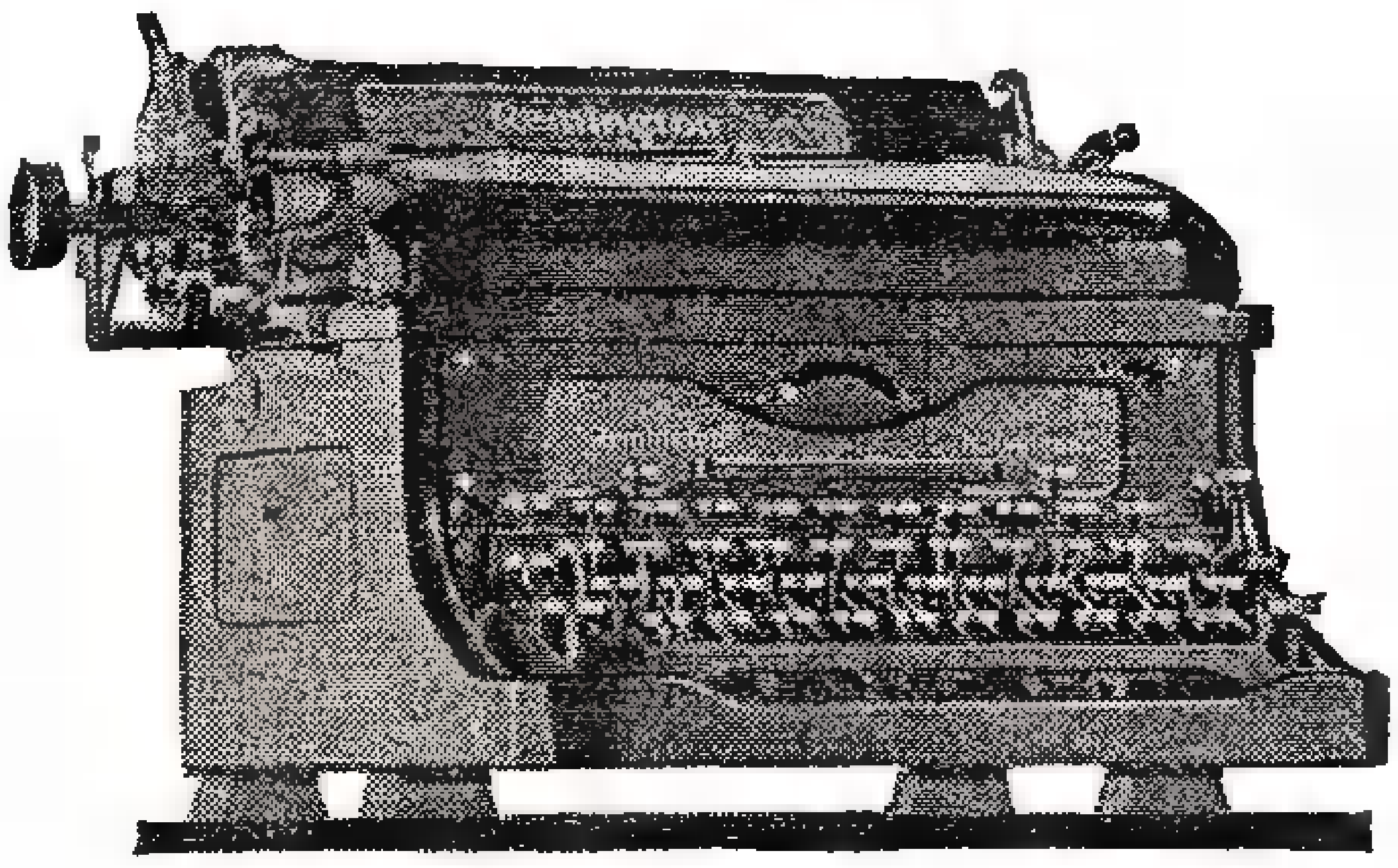
THE FIRST FACTS *to* KNOW

An INVENTION



Model of the First Typewriter

An IMPROVEMENT



Improved Typewriter

The Difference Between "Improvement" and "Invention"

Very few inventions are entirely original. When a friend says of your inventive idea, "Oh, I'm sure something like that has been patented already," the chances are that it has. But your idea may have certain differences or improvements that earn its right to patent protection. The first step is to determine, through patent office search, if there are existing patents that bear on your idea.

THE FIRST STEP

First—secure an experienced Patent Attorney to look after your interests at Washington. It is not the part of wisdom to put-off or delay. And remember—U. S. Patent protection is the only way to obtain the exclusive right to manufacture, use, or sell your invention.

Importance of the "Search"

I can help you immediately. My offices are in Washington. Send your idea to me in rough form. My experienced examiners will make a search through the Patent Office to see if your invention has been anticipated. I can give you a report at once—and this is something you *must* have, because it decides what future steps you should take.

Models and Finished Drawings Unnecessary

Don't spend money or time on finished models or drawings before you know your idea may be patentable. My large staff of experienced patent searchers can handle a search from your description and roughest sketch. The main thing is to put it in my hands as promptly as possible.

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I am a registered U. S. Patent and Trade-Mark Attorney, serving inventors all over the United States. My organization is complete in every particular. I have Draughtsmen, Experienced Searchers, and Attorneys to serve your interests. I have had years of experience in patent matters and know every angle of legal approach. I will secure protection for your idea *if it can be done!* But the longer you delay—the harder it may be for me to serve you.

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ABOUT A PATENT

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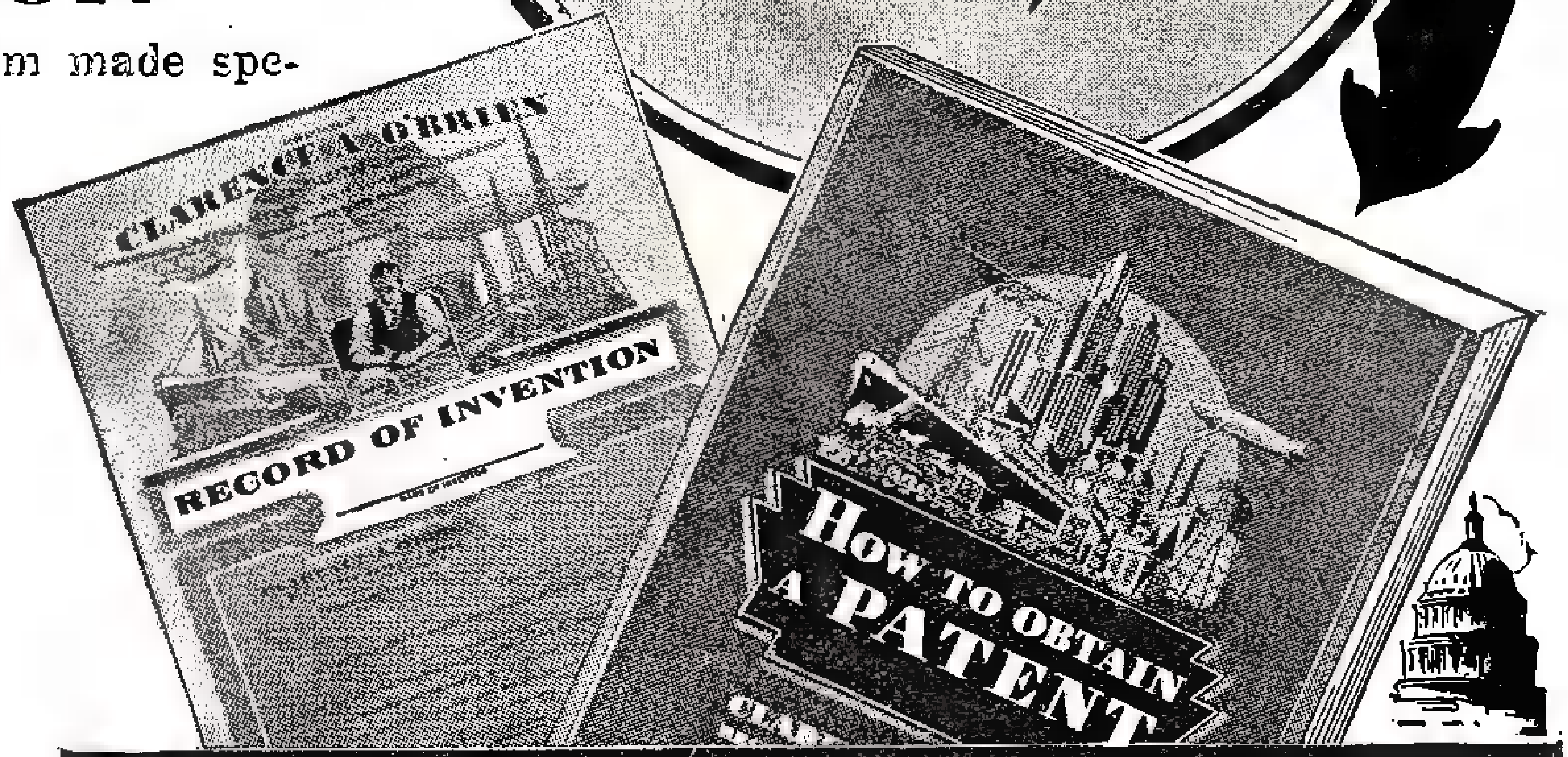

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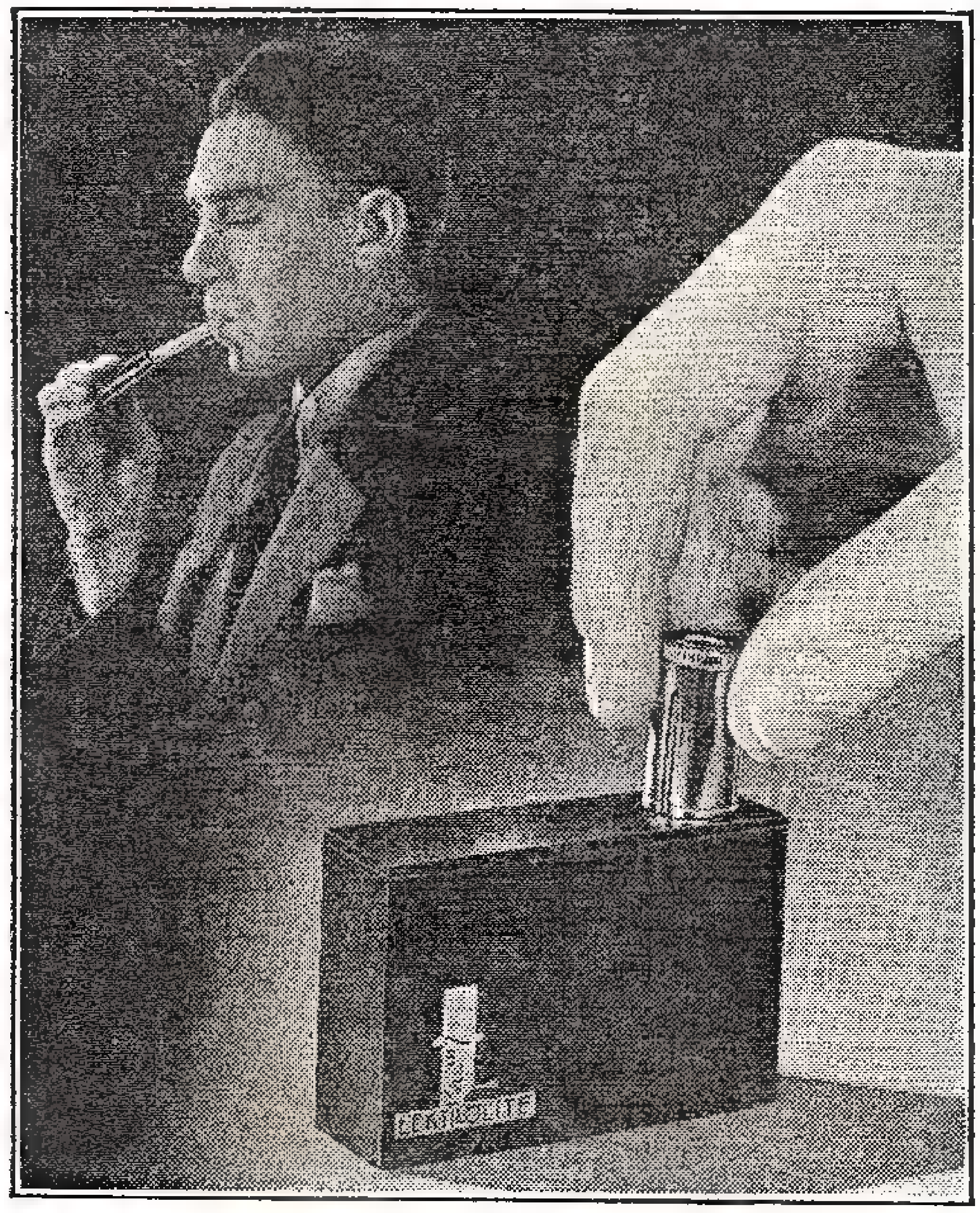
Chemical Lighter Latest Novelty Invention

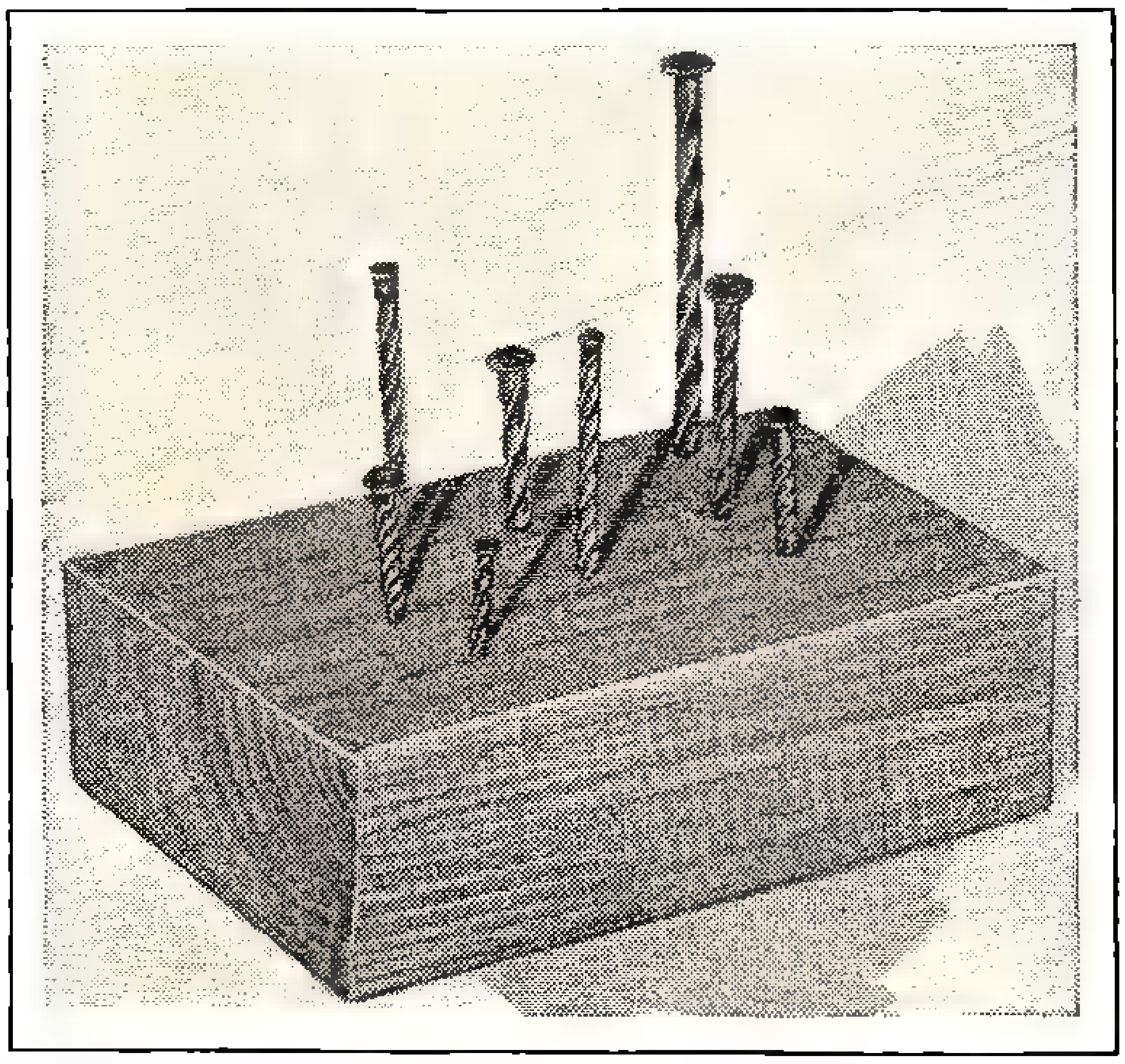
Current business and inventive genius speeds up the modern tempo by designing new devices and improving old ones.



No flame is needed with this fuel cartridge and chemical wick, lighting on contact. Reserve case shown below.

A power unit and oil saver installed in the intake manifold prevents admission of raw gasoline in combustion chamber and crankcase.

Photronic exposure meter for photographers, acting on photronic cell, automatically records amount of light entering lens. Companion dial gives shutter opening and speeds.



A boon to builders are these "screw nails" which drive like nails yet turn and hold with screw-like tenacity.

A dog shower spray with brush and hose, may be attached to a water faucet. Brush holder contains soap, while the turn of a key provides clear water for rinsing.

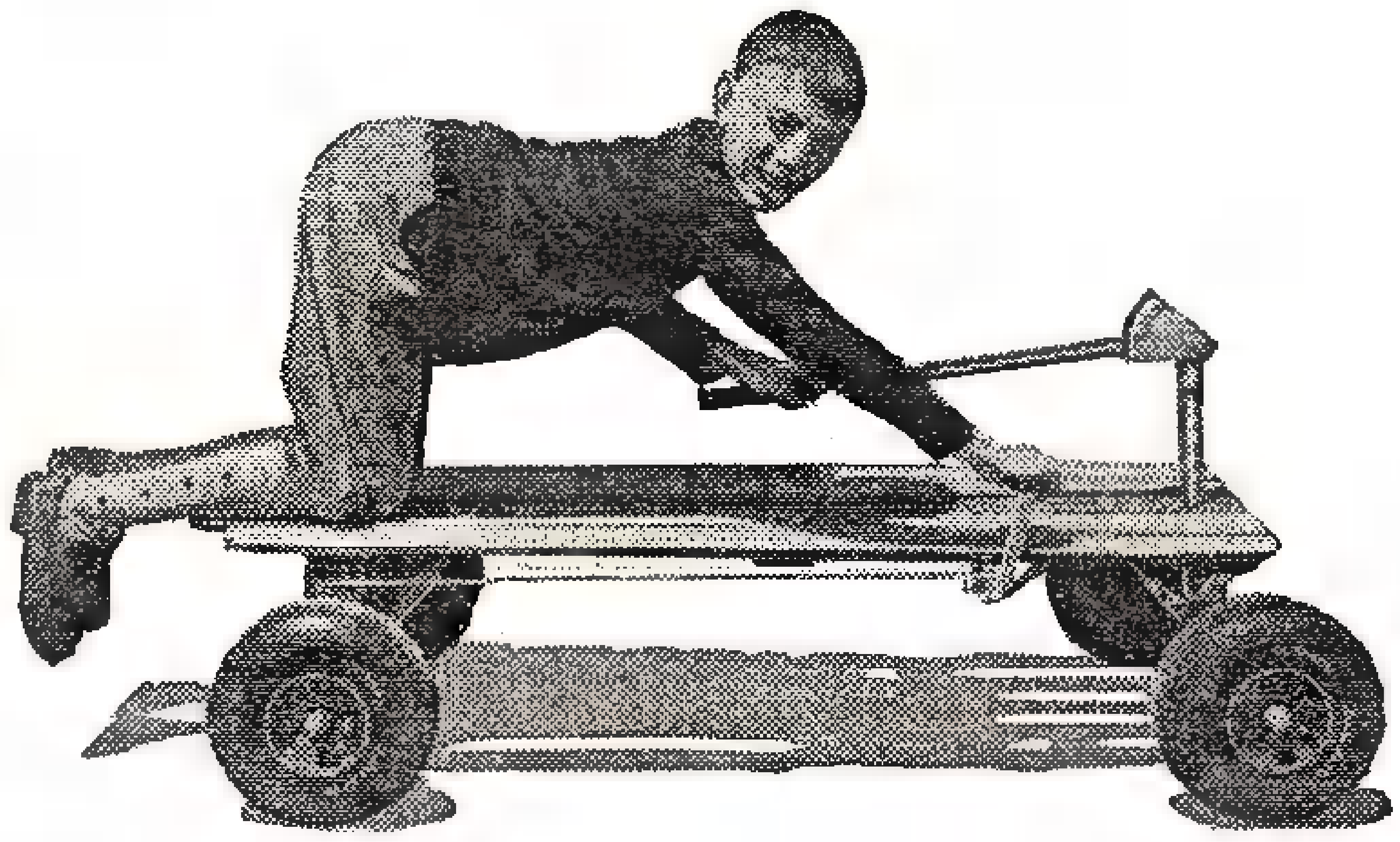
A dandelion killer punctures, scores and injects a killing fluid into the roots of lawn pests without injuring surface grass.

A portable picnic table, mounted on a tripod, can be placed in a level position regardless of ground contour. Height is also adjustable.

A new radio instrument kit now on the market contains devices for measuring all ranges in experimental field except D.C. micro-amperes and radio frequency milliamperes.

Warm kennels for dogs are possible with a new electric pad unit, operating from a light socket and placed in the dog's box.

Two filament display lamps, patterned after the "bright" and "dim" auto headlight bulbs, are available in two-way wattages, resulting in a saving of current in dull hours.



This novel coaster wagon is equipped with balloon tires, brake drums on rear wheels and special steering gear.

A new patching compound, inexpensive and easy to apply, finds countless uses around the home or garage. The compound will patch anything from shoes to auto tires, working equally well with leather, rubber or cloth.

An electric soldering iron is now available at a price well within the range of every man or boy. Invaluable for radio, auto or electrical repairs, the iron comes complete with cord, plug and length of solder.

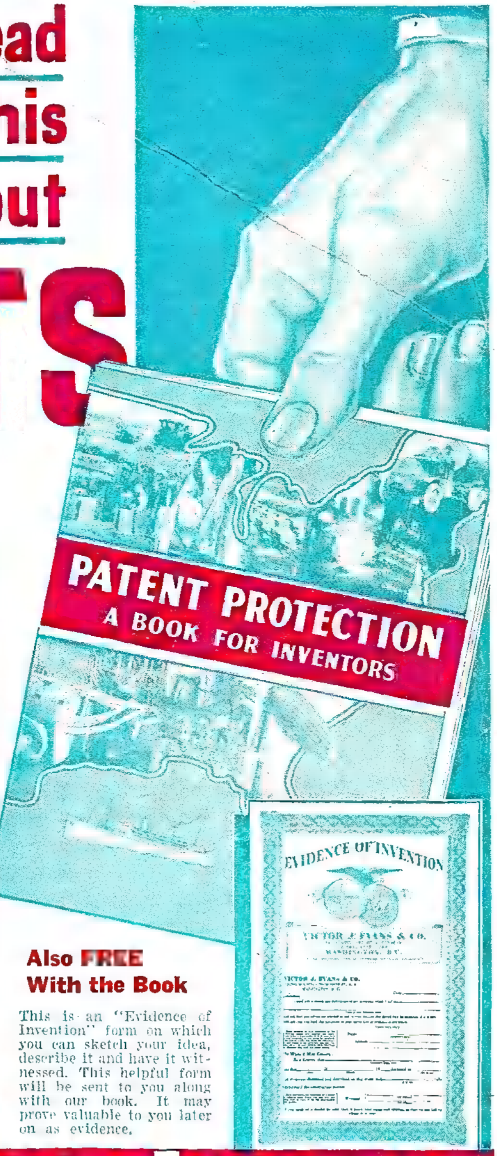
An automatic pencil sharpener, motor driven, starts and stops by insertion or removal of pencil. Various points are easily obtained.

Elimination of spark plug interference is a new auto radio feature now available, guaranteeing perfect reception without use of spark plug "suppressors."

Editor's Note—Information on any of these items can be obtained by writing MODERN MECHANIX AND INVENTIONS. *Manufacturers are invited to submit material for this page.*

Other Men have Read and Profited by this FREE BOOK about

PATENTS



PERHAPS IT WILL BE OF.... DEFINITE INTEREST TO YOU

THIS book was prepared for men of ideas—men who have an article in mind that will make money, save money, save labor or give pleasure. Leading thinkers agree that the opportunity for the inventor is as great today as ever before—that the world of a few years from now will be radically different from the world of today because of the contributions to progress that inventors will make. Now is the time—if you have an idea—to see about fully protecting it so that you can be sure of your just share of whatever profits it may make.

Inventors Do You Know

Exactly how a patent application is prepared, what steps you can take NOW to assure your right to your idea, how the patent laws protect you, what to do to secure financial assistance? This book brings you these and other interesting points; also illustrates important mechanical and electrical principles. Send for it NOW.

Little Ideas Have Big Commercial Possibilities

Don't think that to be profitable an idea needs to be complicated. Simple articles—just a person's hunch—have often proved profitable. The crinkly hair pin, the metal tip for shoe laces, the paper clip, and literally thousands of simple things that most of us use constantly were all the product of invention. Also improvements on patented articles sometimes prove more profitable than the original article itself. If you have an idea—at least see what its possibilities may be and HOW YOU CAN PROTECT YOUR OWN RIGHT TO IT.

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This is an "Evidence of Invention" form on which you can sketch your idea, describe it and have it witnessed. This helpful form will be sent to you along with our book. It may prove valuable to you later on as evidence.

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Many a man has waited until too late to protect an idea by means of a United States Patent. Remember that someone else may be thinking along the same lines that you are; and the Patent Laws favor the man who gets his application for a patent on file in the United States Patent Office first. You may have much to gain—and nothing to lose—by acting promptly. Delays of even a few days can actually mean the loss of a patent. Learn the important facts about Patent Protection at once.

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NO HIGH PRESSURE SELLING
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INCOME EQUAL TO REQUIREMENTS OF THE HIGH-GRADE BUSINESS MAN

G. F. Pegram, Texas, clears $315 in his first 5 days in this business. J. C. May, Connecticut, cleared $262.35 in 9 days. E. Foyer, California, makes $4,920 in 3 months' time. C. W. Ferrell, Ohio, writes: "My earnings have run well above $1,000 in a month's time"—he has made over 1,000 sales, paying him as high as $5—to $60 profit each sale. J. Clarke Baker, Connecticut, sells 13 firms in 3 days' time, netting $151.71 clear profit—over $50 a day profit. Writes that 9 of these 13 firms are already using second or third repeat refill order. And so on. These men had never sold this item before they came with us! How could they enter a field totally new to them and earn such remarkable sums in these desperate times? Read the answer in this announcement. Read about a new business that does away with the need for high pressure selling. A rich field that is creating new money-making frontiers for wide-awake men. Those who enter now will pioneer—to them will go the choicest opportunities.

FOUR $15 SALES DAILY PAY $280 WEEKLY

INSTALLING NEW BUSINESS SPECIALTY ON FREE TRIAL—MAKING EXCEPTIONAL CASH SAVINGS FOR CONCERNS THROUGHOUT THE U. S. AND CANADA

$4,707 Returns For One Kansas Store in Three Months

Sanders Ridgway, of Kansas, invests $88.60 and shows returns of $4,707.00 between April 5th and June 29th! Bowser Lumber and Feed Co., West Virginia, invests $15, report returns well over $1,000.00! Fox Ice and Coal Co., Wisconsin, returns $3,564.00! Baltimore Sporting Goods Store invests $45, returns $1,600.00! Pollom & Son, Indiana, in 45 days turned $15 installation into $2,250.00 cash.

With these and scores of similar results to display, our representatives interest business men from the [illegible] smallest to the very largest. [illegible] one can dispute the proof in [illegible] photo-copies of actual lette[illegible] our men show.

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Here is a business offering an invention so successful that we make it sell itself. Our representatives simply tell what they offer, show proof of success in every line of business and every section of the country. Then install the specialty without a dollar down. It starts working at once, producing a cash return that can be counted like the other cash register money. The customer sees with his own eyes a big, immediate profit on his proposed investment. Usually he has the investment, and his profit besides, before the representative returns. The representative calls back, collects his money. OUT OF EVERY $75 BUSINESS THE REPRESENTATIVE DOES, NEARLY $60 IS HIS OWN PROFIT! THE SMALLEST HE MAKES IS $5 ON A $7.50 SALE! Our men are making sales running into the hundreds. They are getting the attention of the largest concerns in the country, and selling to the smaller businesses by the thousands. You can get exclusive rights. **Business is GOOD, in this line, in small towns or big cities alike! It's on the boom now. Get in while the business is young!**

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Without obligation to me, send me full information on your proposition.

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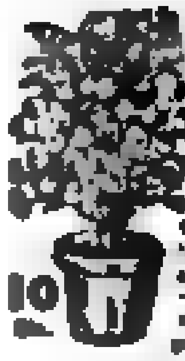
Double Page Spreads

[redacted] Try Some of These Remarkable Seed Novelties [redacted]

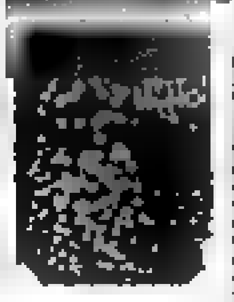


[redacted] ROSE BUSHES

The Wonder of the World

Japanese Rose Bushes **bloom all the year round.** Just think of it — [illegible] weeks after planting the seed, the plants will be in **full bloom.** It may not seem possible, but we positively **guarantee it to be so.** They will **bloom every ten weeks,** Summer or Winter, and when three years old the bush will be **a mass of roses,** bearing from five hundred to a thousand roses on each bush. The flowers are in three shades — white, pink, and crimson. The plants will do well both in and out doors. We guarantee at least three bushes to grow from each packet of seed. **Price, 10c packet, 3 pkts. for 25c postpaid.**

10c

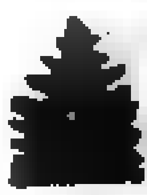


[redacted] FIREFLY PLANT

A Vine that Blooms at Night

Fills the Atmosphere with Fragrant Aroma

One of the most rapid growing vines known. Under favorable conditions this vine has been known to grow 15 FEET IN A SINGLE WEEK. In a very short space of time [illegible] to a great height, and is covered with IMMENSE FLOWERS from 5 to 7 inches in diameter. It is, indeed, a great novelty, for, unlike other plants, the flowers OPEN IN THE EVENING, and [illegible] again the following day. In dull weather they will [illegible] all day. It is a most INTERESTING SIGHT to watch the opening and closing of the flowers as they slowly appear and disappear. As the flowers open they give forth the most DELIGHTFUL AROMA and the [illegible] fragrance. It [illegible] of favorable comment, and [illegible] people [illegible] at night time so as the scene of the flowering [illegible], frequently stopping in an endeavor to satisfy their curiosity. **PRICE 10 CENTS packet, two packets for 25 CENTS, POSTPAID. JOHNSON SMITH & CO.**



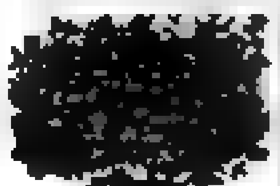
Chinese Fragrant Tree Fern

Just imported. Noted for its rapid growth. A most exceptionally [illegible] ornamental plant. [illegible] grow [illegible] perennial [illegible] feet high [illegible] desirable for decorative purposes, [illegible] etc. **Seeds 15c pkt., 3 for 40c.**

Weather Plant

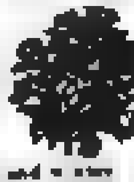
NATURE'S WEATHER PROPHET

By mysterious changes that take place, this remarkable plant accurately foretells the weather many hours in advance. Will grow anywhere all the year around. An interesting house plant. Bears large, fragrant, pink, butterfly shaped flowers. **Seeds, 15c packet, 3 for 40c, postpaid.**



The Great Wonderberry

A luscious berry that may be grown and ripened from seed in one season. [illegible] The flavor is fine and unsurpassed for eating raw, cooked, canned or preserved in any form. The fruit is [illegible] in color, and tastes like a luscious, rich blueberry. One bush will produce an enormous amount of fruit, yielding great quantities of rich fruit all Summer and Fall. **Packet, 10c, 3 pkts. for 25c, postpaid.**

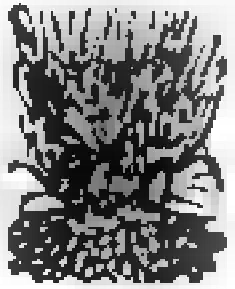


Shoo Fly Plant

A very remarkable [illegible] it is said flies will not [illegible]. Bears very pretty [illegible] and a [illegible]. **Seeds 15c pkt., 3 for 40c, postpaid.**

Banana Musk Melon

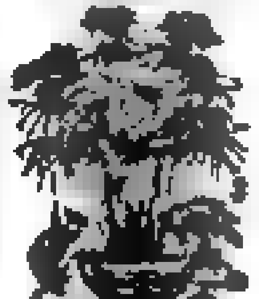
[illegible] a curiosity. [illegible] shape and the delicious flavor [illegible] flesh is deep and of [illegible] flavor. [illegible] as high as a dollar [illegible] for one single specimen. **Seeds 15c, 3 pkts. for 40c.**



GROUND ALMONDS

Amazingly Prolific—Easily Grown From [redacted]

The Ground Almond has a flavor that is MOST EXCELLENT, resembling the cocoanut. The meat is snow white, covered with a shell or skin of brown color. It grows close to the surface and anything from 200 to 300 Almonds may be expected from a single nut. There is no trouble whatever in growing anywhere and in any kind of soil. May be planted any time, and in eight or ten weeks from time of planting you will have an [illegible] of the MOST DELICIOUS ALMONDS YOU EVER TASTED. **Seeds 15c Pkt.**

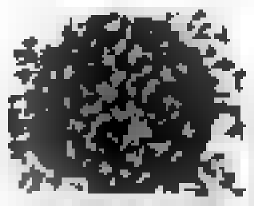


The Great Japanese Umbrella Palm

A Graceful Parlor or Conservatory Plant

Easily Grown From Seed Winter or Summer

The Javanese Umbrella Palm is a semi-aquatic plant. It is easily grown from seed either in a bowl of water or in very damp soil. Probably the most novel, as well as the most interesting method, [illegible] plant [illegible] with water, with three or three inches of [illegible] garden soil at the bottom. [illegible] and the plant [illegible] grows to [illegible] three feet high [illegible] pretty palm-like appearance [illegible] in the engraving. [illegible] of a very [illegible] appearance. We will send [illegible] for only **10c or three packets for 25c postpaid.**



Perfume Plant

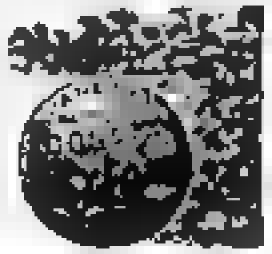
Blooms only at night, giving forth the most delightful scented fragrance [illegible] garden. Also valuable [illegible] **Seeds from [illegible], 15c pkt., 3 for 35c.**

SENSITIVE PLANT

Marvel of the Philippines. Leaves curl, [illegible] droop when touched. Apparently [illegible] interference. A handsome [illegible] for home or garden; very curious and interesting. **Seeds, 15c pkt., 3 for 40c.**

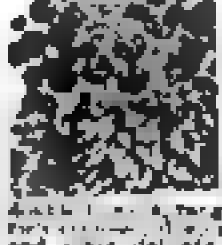
Calabash or Pipe Gourds

A handsome and rapid growing climber. [illegible] Grow this [illegible] with instructions, **15c pkt., 3 for 40c.**



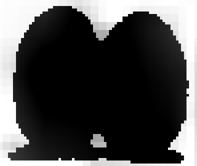
Japanese Nest Egg Gourd

Very curious. [illegible] shape and [illegible] each. Will [illegible] as a [illegible], [illegible] or ornamental purposes, etc. **Seeds 15c pkt., 3 pkts. for 40c, J. S. & CO.**



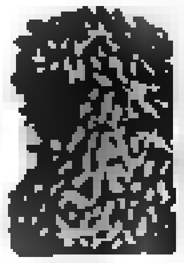
Butterfly's Own Bush

The plant is a [illegible] the butterflies, and it [illegible] all the [illegible] types of butterflies [illegible] ranging from [illegible] and [illegible] delicate shades. **Packet 10 cents, 3 for 25 cents postpaid.**



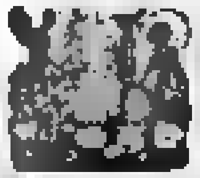
[redacted] MEXICAN FIREFLY PLANT

Beautiful hedge plant, grows 2 to 3 feet high [illegible] ornamental [illegible] pleasing [illegible] green [illegible]. May be grown singly or in the form of a hedge [illegible] the name of Mexican Fire Plant [illegible] **Selected Seeds 15c.**



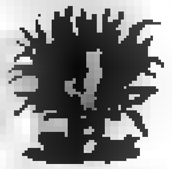
Mammoth Peanuts

Peanuts can be easily cultivated. Their culture is very simple and exceedingly interesting. Mammoth Peanuts grow to an astonishing size. It is a good producer, very prolific, and the giant nuts have a thick, heavily ribbed protecting shell. The plant is very attractive, the leaves being of oval shape and a handsome green shade, tinted through the [illegible] with white. You will derive much pleasure [illegible] this interesting novelty. **Seeds 15c pkt., 3 pkts. for 40c.**



CACTUS FROM SEED

Very curious, odd looking, strange [illegible] will [illegible] of the [illegible] **Packet, 10 cents, Three packets for 25 cents, postpaid.**

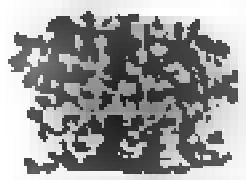


FERN SEED

Ferns can be grown from seed [illegible] **Packet 10c, 3 for 25c.**

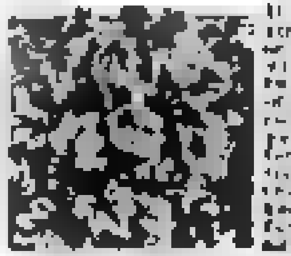
Asparagus Sprengeri

The best plant for hanging baskets. Masses of rich, glistening foliage drooping in a very graceful manner. [illegible] will last for weeks in water. The seed pods are very pretty [illegible] **Packet, 15c, 3 pkts. for 40c postpaid.**



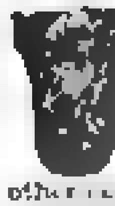
Musk Plant

A universally admired favorite [illegible] A very fast [illegible] plant [illegible] giving forth musk fragrance. Also [illegible] the perfume that can be made from it. **Seeds 15c pkt., 3 for 40c.**



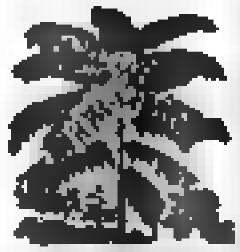
Japanese Climbing Cucumber

Unusually strong and rapid growing vine. [illegible] climbs readily on fences, poles, [illegible] **Seeds 15c packt. 3 for 40c, postpaid.**



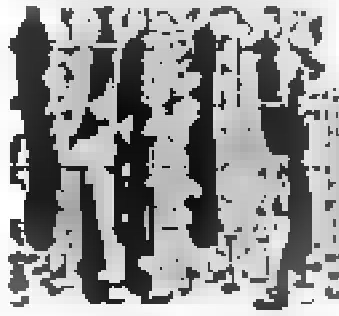
Chinese Cabbage

Novelty from China and should be grown in every garden. Seems to be a cross between Celery and Cos Lettuce. Flavor is more mild than any other cabbage. **Can be served on the table** and eaten raw or cooked like cabbage, or lunch of lettuce or made into salad. Grows very rapidly, easy to cultivate. You can create quite a sensation by cultivating this remarkable novelty. **Seeds, 15c packet, 3 pkts. for 40c.**



TREE OF HEAVEN

The [illegible] is called the Tree of Heaven [illegible] Very hardy [illegible] feet high from seed [illegible] **Packet, 15c, 3 packets 40c.**



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[illegible] The delicate Buttery [illegible] very prolific, and a most welcome [illegible] in your garden. Try them [illegible] the most delicious vegetable you have ever tasted. [illegible] **25c, postpaid.**

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Most rapid growing vine known. Will grow 20 feet in one week. Luxuriant foliage, lovely purple flowers, very fragrant. Nothing to equal it for shade purposes and quick growth. **Seeds 15c packet, 3 for 40c.**

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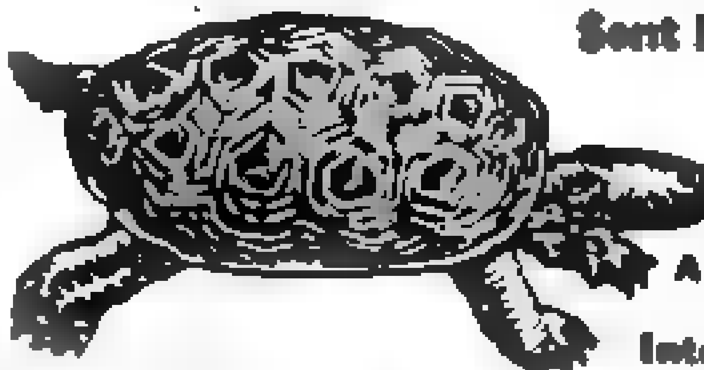

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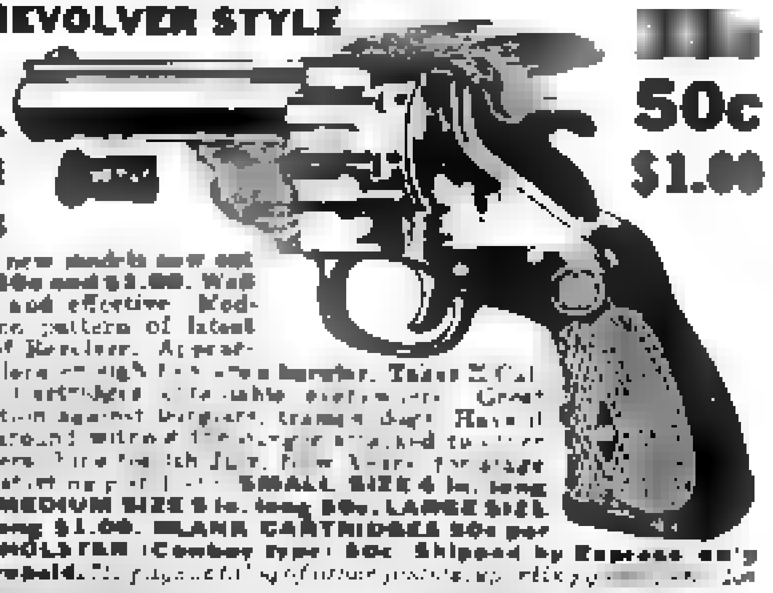

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MADE IN 3 SIZES

[redacted]

50c

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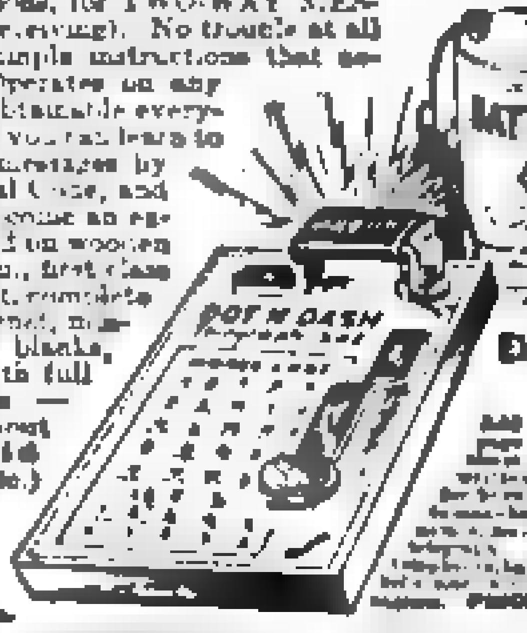

The Boy Electrician [redacted]

Add 10c for 64 page book of [illegible]

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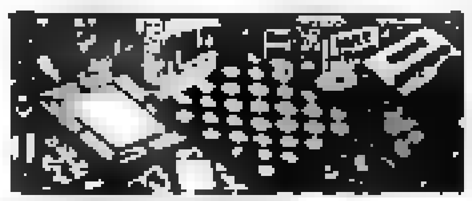

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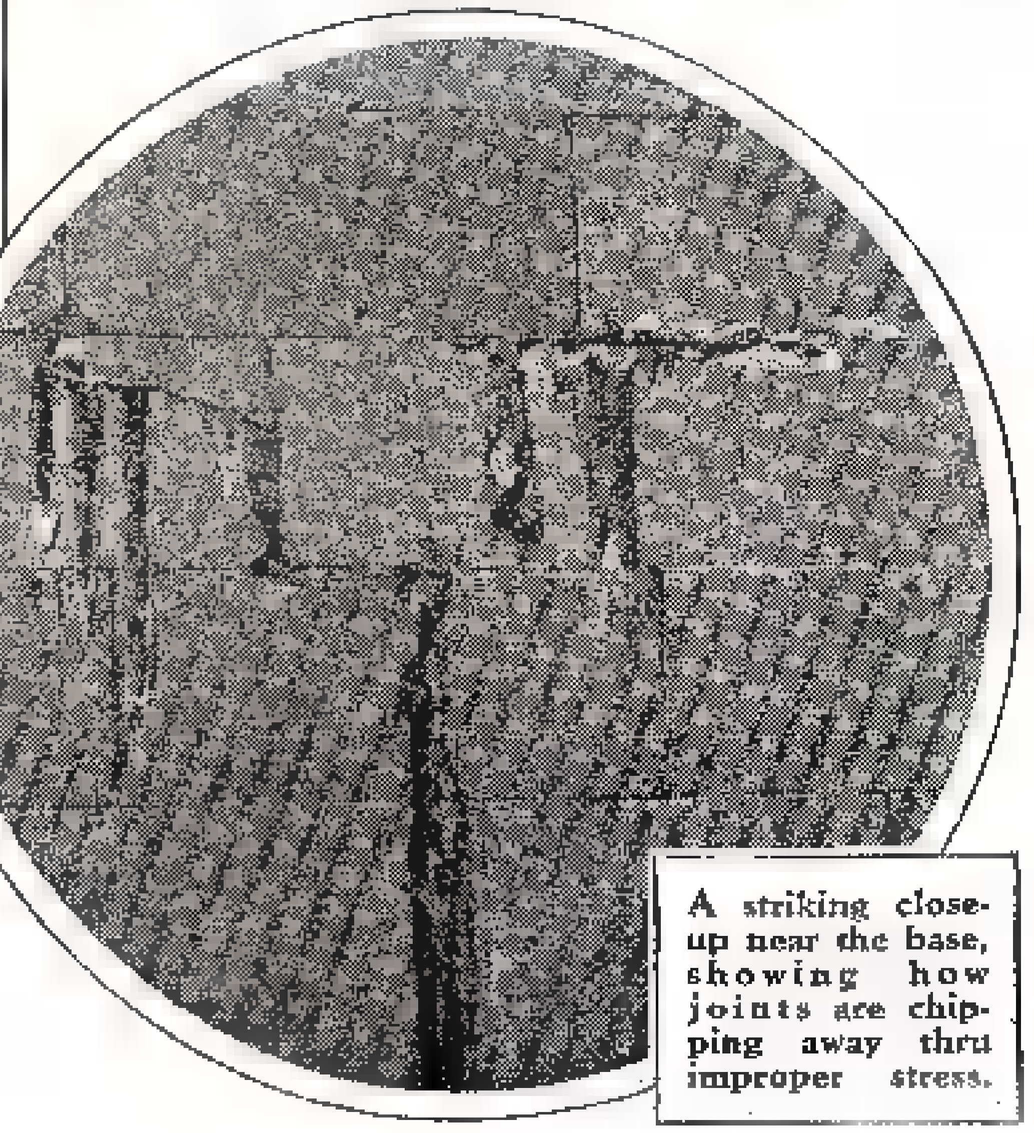
WILL the WASHINGTON MONUMENT CRASH?

by JAMES NEVIN MILLER

Secretly probing threatened destruction of America's famous memorial, federal experts unearthed [redacted] host of startling facts. Here, for the first time, is the amazing, inside story!

Cherry blossoms—and potential tragedy. Is the famous obelisk doomed by deterioration of inferior marble? Note the discolored base, showing area under observation.



A striking close-up near the base, showing how joints are chipping away thru improper stress.

IS THE Washington monument crumbling? Are its marble sides deteriorating to such an extent that visitors are endangered by falling stone? Is America's most famous memorial destined to come crashing down upon the nation's capital city?

These disturbing questions confronted federal officials not long ago. A large number of visitors had been waiting to enter the memorial when a missile suddenly hurtled downward, striking with a crash near the base of the structure and narrowly missing two people standing in line.

A chunk of marble as big as the average man's fist had chipped away from a section of the monument less than 150 feet from the ground!

The narrowly averted tragedy galvanized government officials into action. Other fragments had fallen previously. The next missile might take its toll of human life. And always there was the whispered threat that perhaps the entire monument might come crashing down with untold disaster in its wake.

A secret investigation was quickly launched to determine the causes of the memorial's deterioration. An appropriation of $100,000 was rushed through by the Public Works Administration. Since then federal engineers and stone specialists from the Bureau of Standards have worked tirelessly, carrying on intensive tests which have revealed a host of startling facts.

At first investigators were not sure whether the chipping away of the marble was caused by inferior quality of the stone, by the natural weathering process or by improper distribution of weight.

Survey of the site revealed that the round top hill on which the monument stands is exceptionally windy. Like the famous Flatiron building in New York City, the shape of the memorial acts with the air currents to produce severe whirlwinds. Experts wondered whether the terrific lashing of these winds against the shaft would be sufficient to account for the deterioration.

Seeking an answer to their questions, scientists first considered the history and the makeup of the monument. The face of the shaft is of marble while the interior facing is of granite. It is 555 feet one-eighth inches high, 55 feet one and [redacted] half inches wide at the base outside and 25 feet inside. The walls are 15 feet one-quarter inch thick at the base and 18 inches at the top. The taper of the shaft is one-fourth inch to one foot.

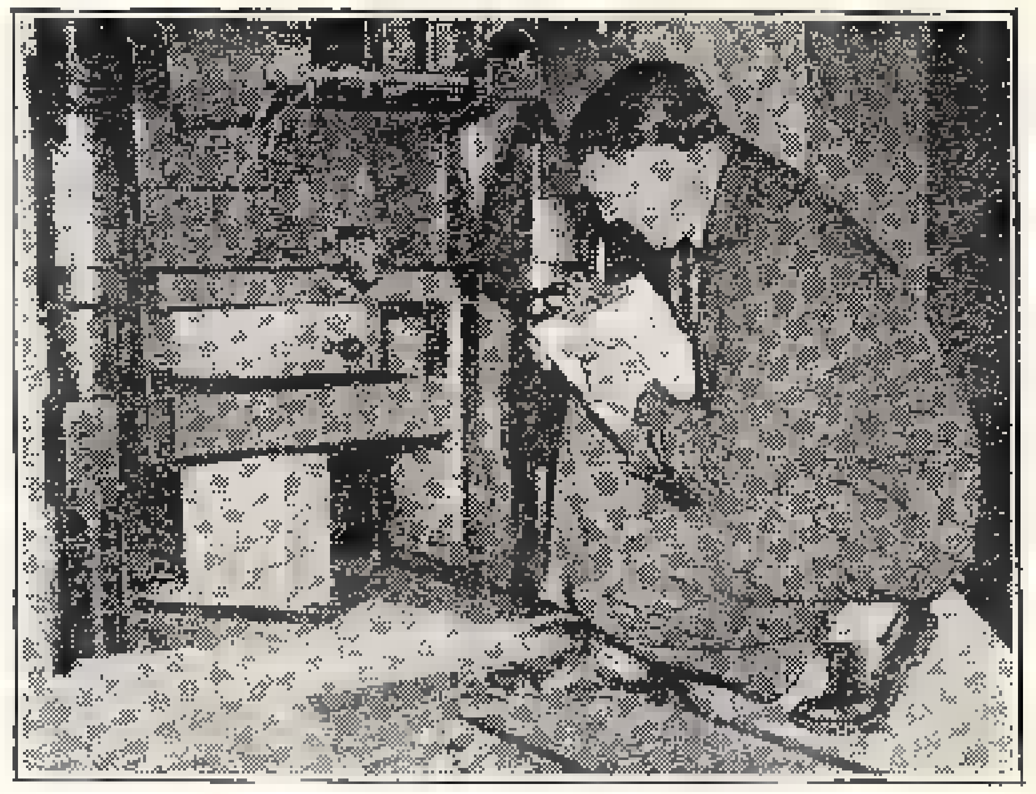
The total weight of the monument is 81,120 tons. There are 898 steps, 50 landings and 8 windows at the top. There is an electric elevator with a carrying capacity of 30 persons.

The memorial was constructed to a height of about 153 feet by the Washington Monument Society, organized October 31, 1833. The cornerstone, a block of marble weighing 24,500 pounds, was quarried and presented to the Society by Thomas Symington of Baltimore, Md. It was laid July 4, 1848, under the auspices of the society.

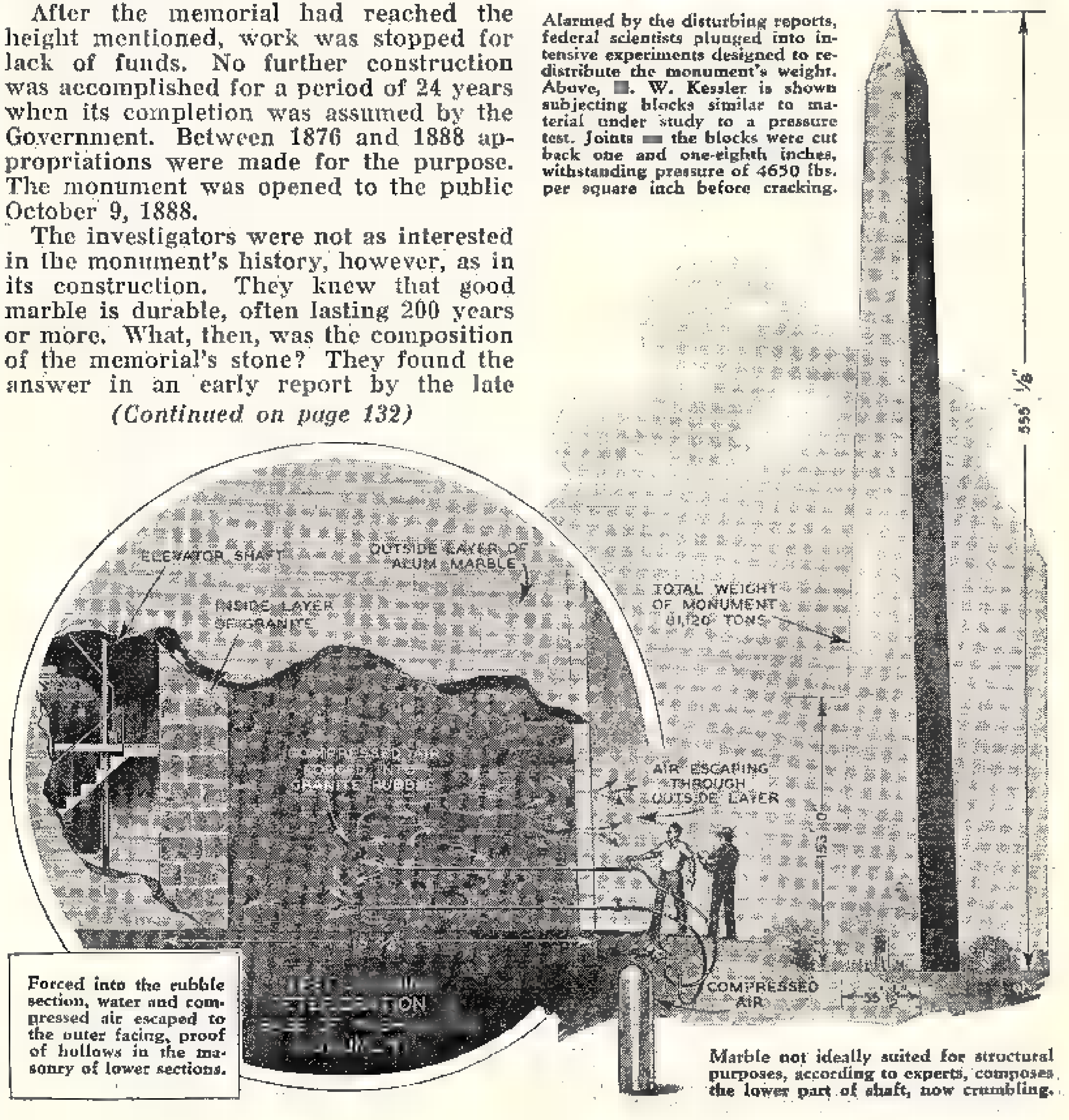
After the memorial had reached the height mentioned, work was stopped for lack of funds. No further construction was accomplished for a period of 24 years when its completion was assumed by the Government. Between 1876 and 1888 appropriations were made for the purpose. The monument was opened to the public October 9, 1888.

The investigators were not as interested in the monument's history, however, as in its construction. They knew that good marble is durable, often lasting 200 years or more. What, then, was the composition of the memorial's stone? They found the answer in an early report by the late

(Continued on page 132)



Alarmed by the disturbing reports, federal scientists plunged into intensive experiments designed to redistribute the monument's weight. Above, [redacted]. W. Kessler is shown subjecting blocks similar to material under study to a pressure test. Joints [redacted] the blocks were cut back one and one-eighth inches, withstanding pressure of 4650 lbs. per square inch before cracking.


ELEVATOR SHAFT
OUTSIDE LAYER OF ALUM MARBLE
INSIDE LAYER OF GRANITE
TOTAL WEIGHT OF MONUMENT 81,120 TONS
COMPRESSED AIR FORCED INTO GRANITE RUBBLE
AIR ESCAPING THROUGH OUTSIDE LAYER
COMPRESSED AIR
555 ⅛
153 0
55 ½

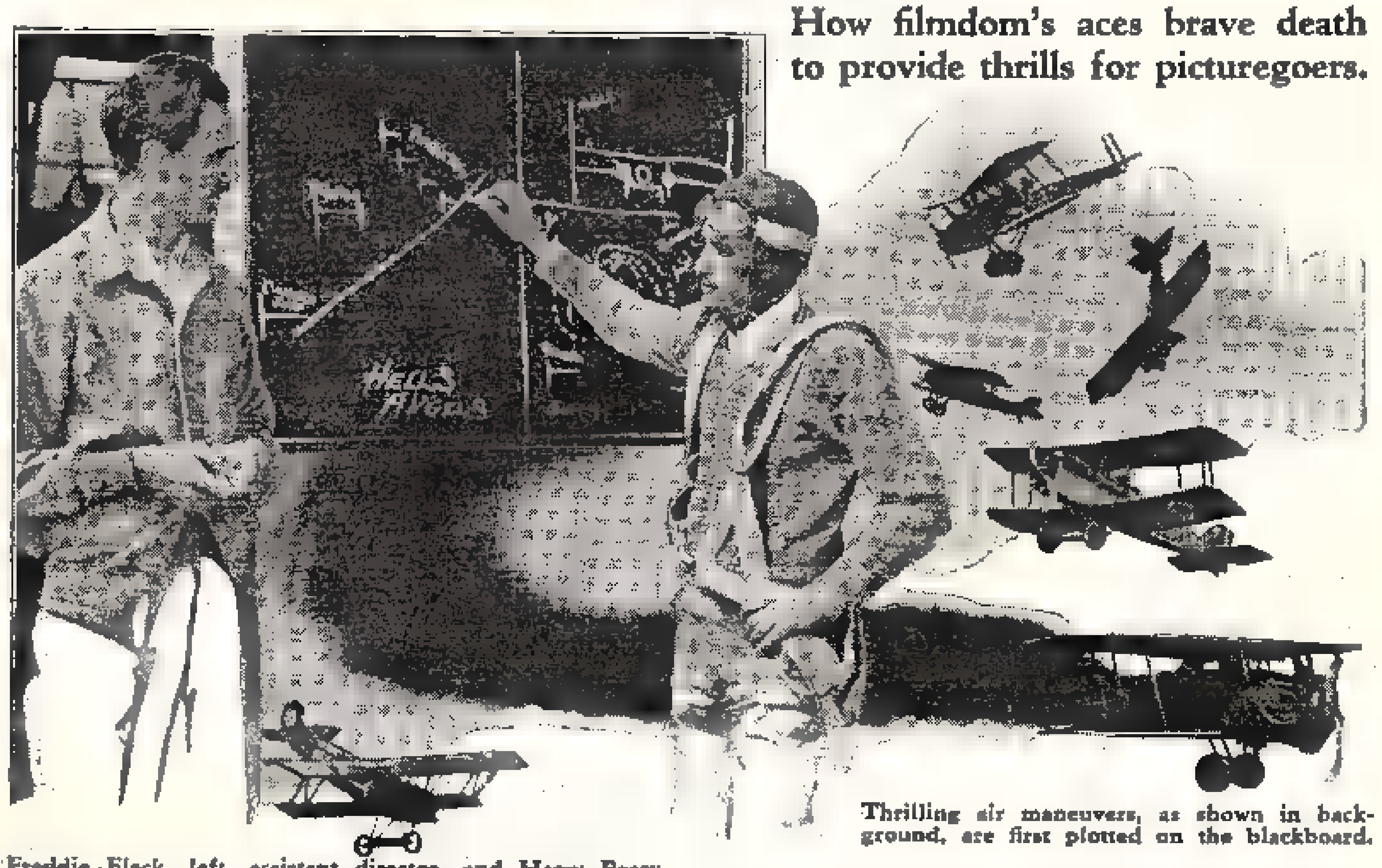
Forced into the rubble section, water and compressed air escaped to the outer facing, proof of hollows in the masonry of lower sections.

Marble not ideally suited for structural purposes, according to experts, composes the lower part of shaft, now crumbling.

CRASHING AIRPLANES *for the* MOVIES

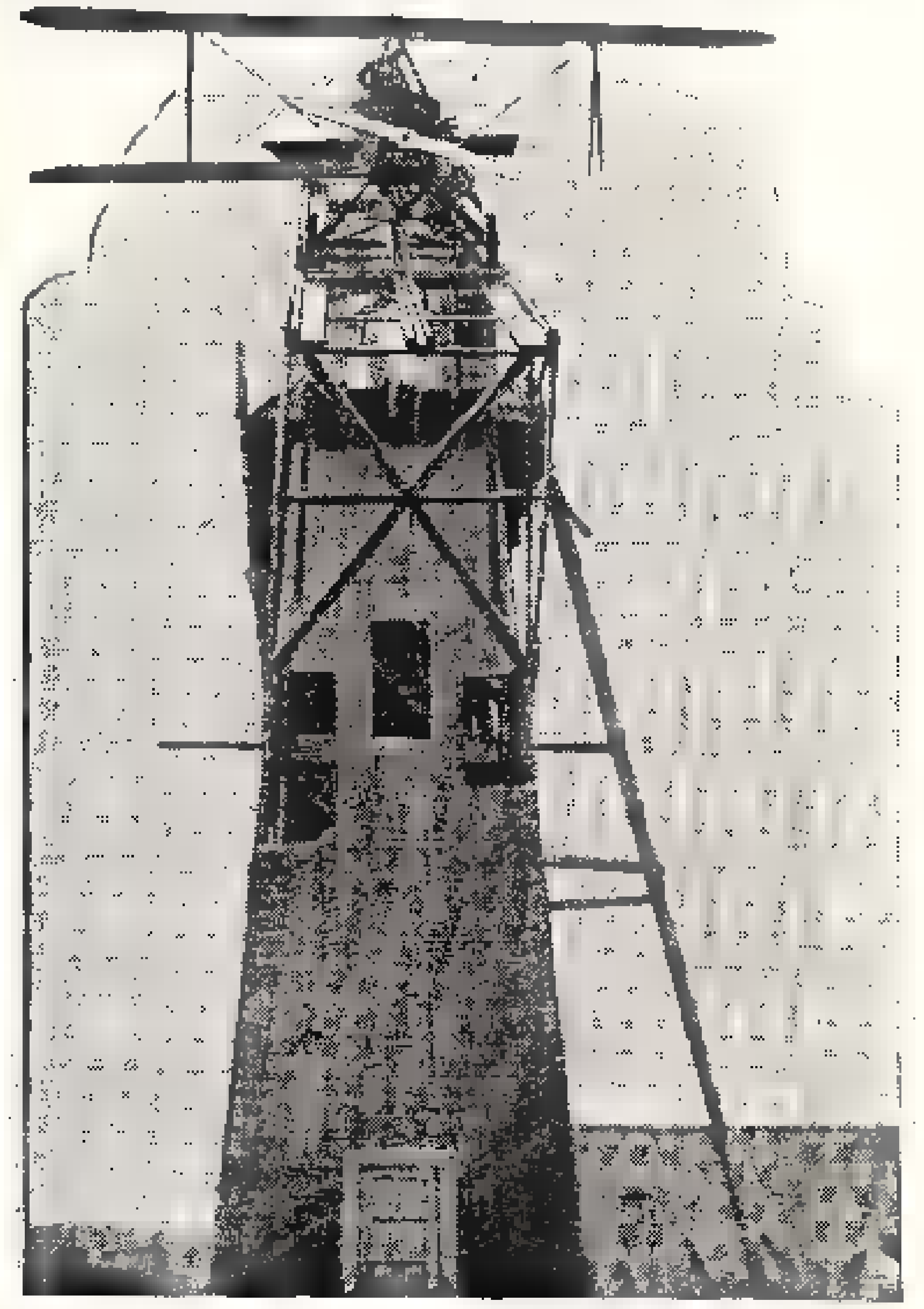
by JAMES BOWLES

How filmdom's aces brave death to provide thrills for picturegoers.



Freddie Fleck, left, assistant director, and Harry Peary, chief cameraman, diagram the action for one of the sensational dog fights featured in "Hell's Angels."

Thrilling air maneuvers, as shown in background, are first plotted on the blackboard.



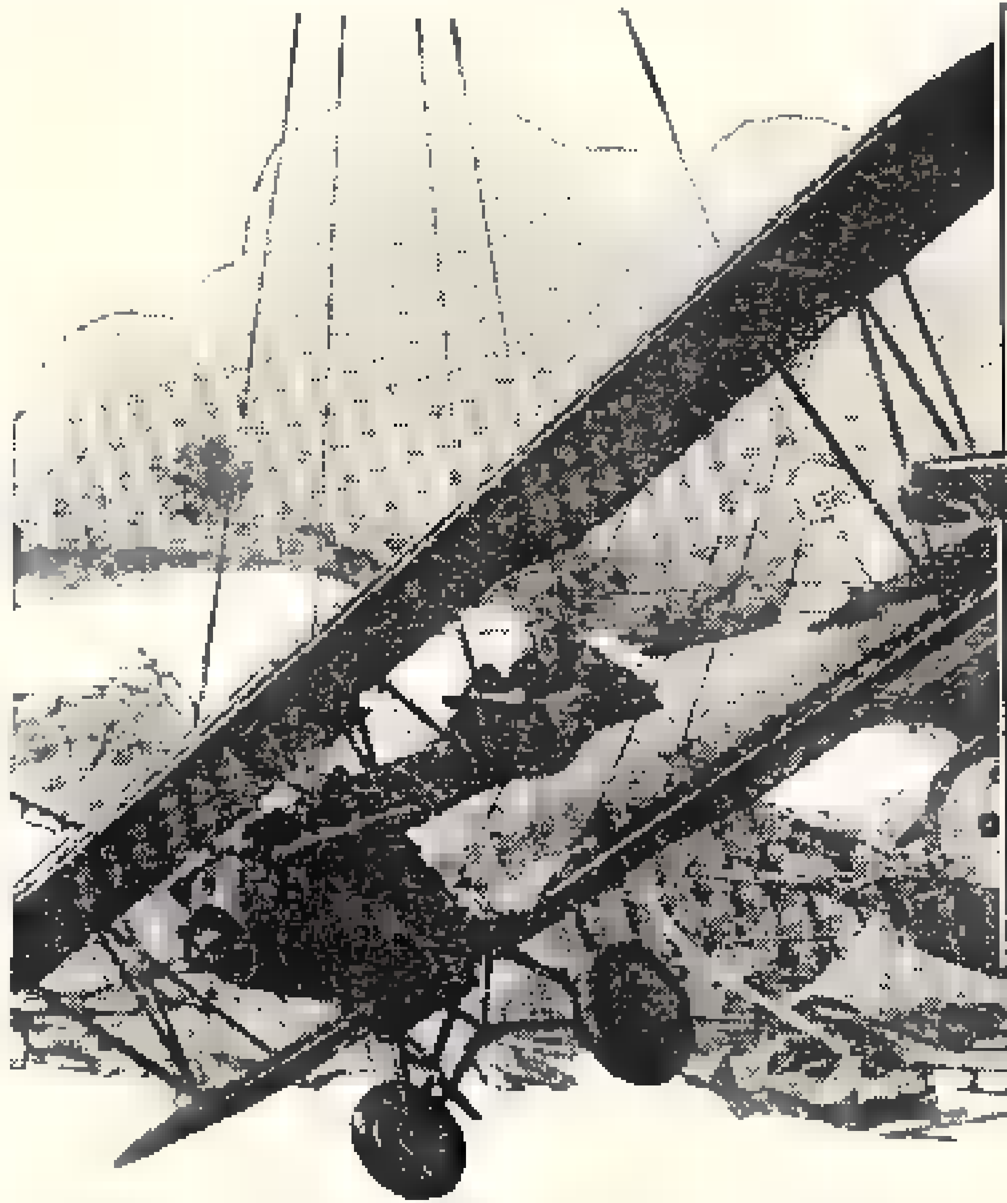
Needless risk of life is overcome by this catapult which launches pilot-less planes down a wooden runway to their crashing point. (See photograph on opposite page.)

MOTOR idling, prop turning over lazily, a pilot-less plane stands on the airport runway awaiting passengers. Suddenly the motor roars into life, the prop becomes a flashing circle of steel and the plane leaps down the field. A passenger has accidentally tripped the throttle and the ship is running wild!

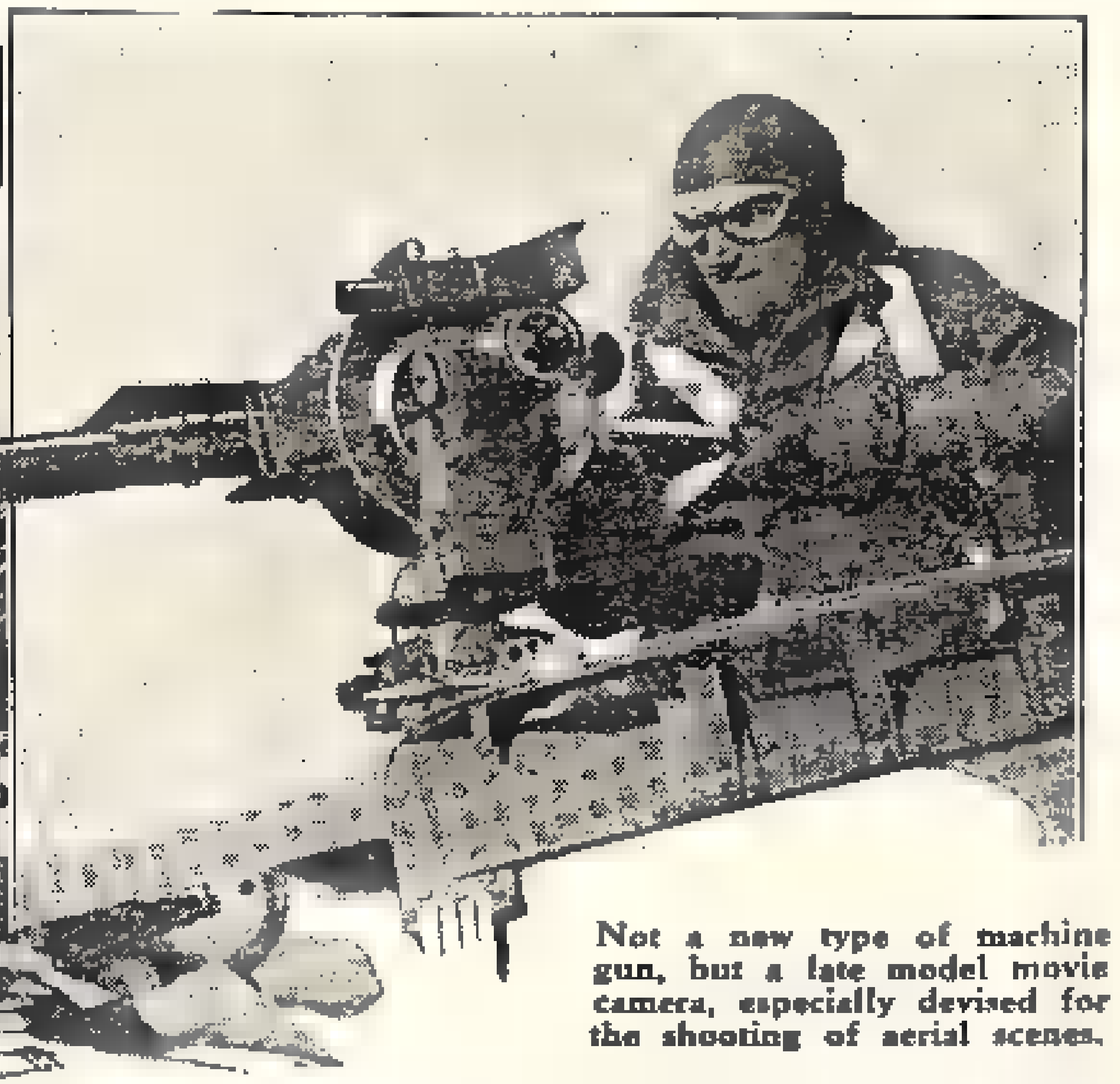
The staccato roar of a second plane fills the air. Another pilot guns his ship to the full to head off the runaway. At mile-a-minute speed they hurtle toward each other. A resounding crash and the two airplanes are locked in a splintering death embrace. Again two pilots have gambled with eternity to supply a movie thrill—and miraculously escaped.

Oddly enough, the foregoing stunt, a scene from "Central Airport," although confined entirely to the ground, was more hazardous than various breath-taking shots which are filmed in the air.

One of the spectacular crashes which highlighted "The Lost Squadron," for instance, was entirely devoid of personal danger, albeit thrilling in the extreme. The plot of the story called for the unnecessary death of a stunt flyer who was to crash a plane in a village street immediately before the cameras. To accomplish the feat, a pilot-less plane was shot from a gigantic catapult to its crashing point. The only hitch in the proceedings occurred when a slight directional error crashed the plane on a rooftop instead of in the street below.



In crash sequences calling for closeups of the actors, planes are frequently strung on wires, a trick once used extensively to simulate collisions in early film production.



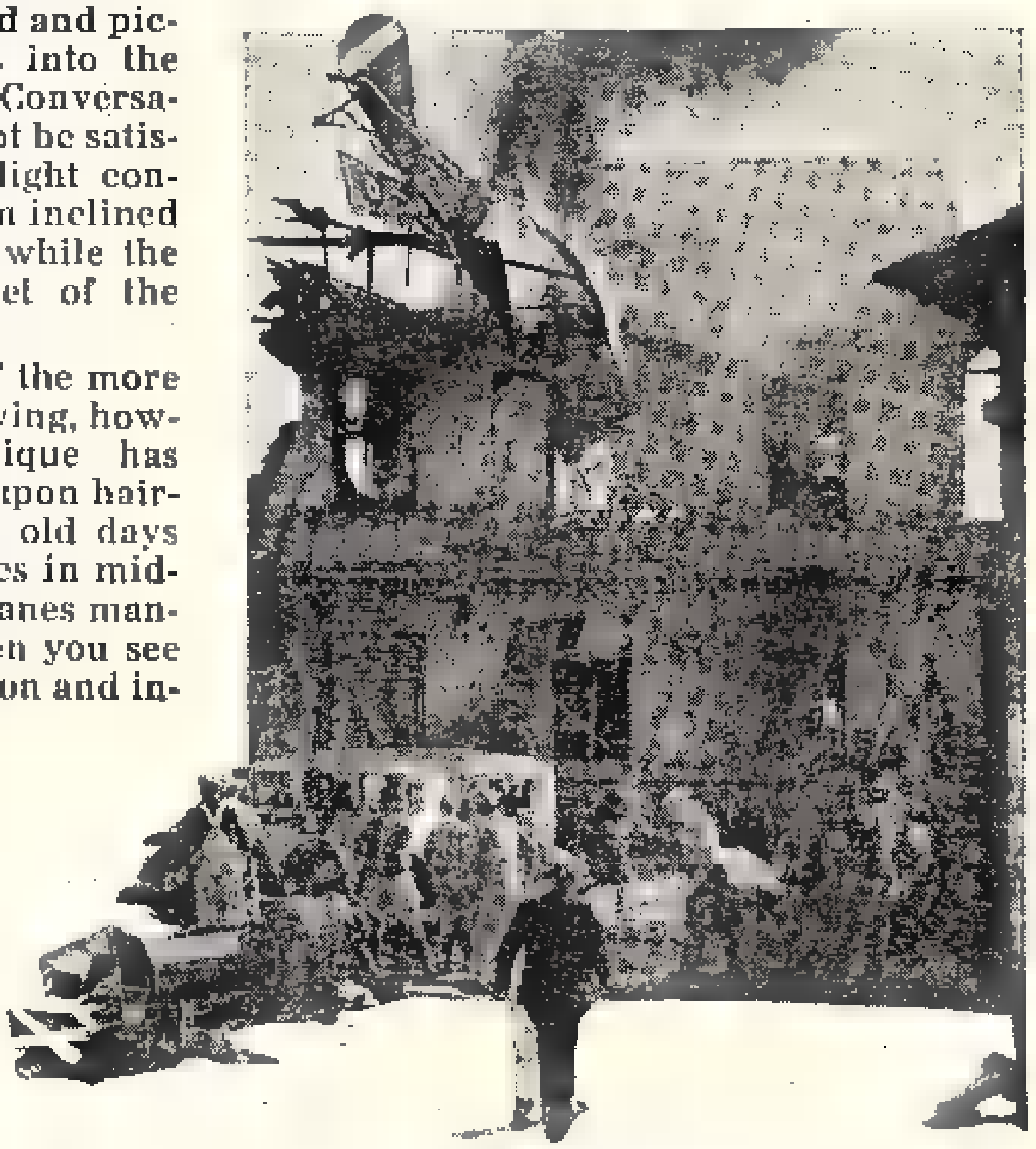
Not a new type of machine gun, but a late model movie camera, especially devised for the shooting of aerial scenes.

In these days of improved sound and picture technique, head-on crashes into the ground are seldom attempted. Conversation and closeups obviously cannot be satisfactorily recorded under such flight conditions. Dummy planes drop from inclined runways to provide the crashes while the closeups are filmed in the quiet of the barn-like sound stages.

Despite the removal of some of the more obvious dangers of movie stunt flying, however, improved picture technique has placed an even greater premium upon hairline precision in the air. In the old days some of the daring fight sequences in mid-air were enacted by miniature planes manipulated by wires; but today when you see several planes looping in formation and indulging in various aerobatics you may rest assured that daring pilots actually went aloft and performed the thrilling maneuvers in person.

The customary procedure prior to the filming of a dog fight sequence is to plot the action in a chalk-talk session reminiscent of the football field. "This," explains the chief pilot, drawing scrawls on the blackboard, "will be the dog fight action.

"I'm going to give Jack the slow plane. Earl takes the red ship and follows Jack. I'll fly the gray plane and force Earl out from all angles. Let's make it short and snappy—like a series of real crashes in the air."



Launched from the catapult at left, this plane crashed spectacularly in "The Lost Squadron" without endangering life. The only miscarriage in plans came through a slight directional error when the plane crashed on the roof instead of in the street, before the cameras, as intended by the director.

Learn to Play BASEBALL from BIG LEAGUE Stars

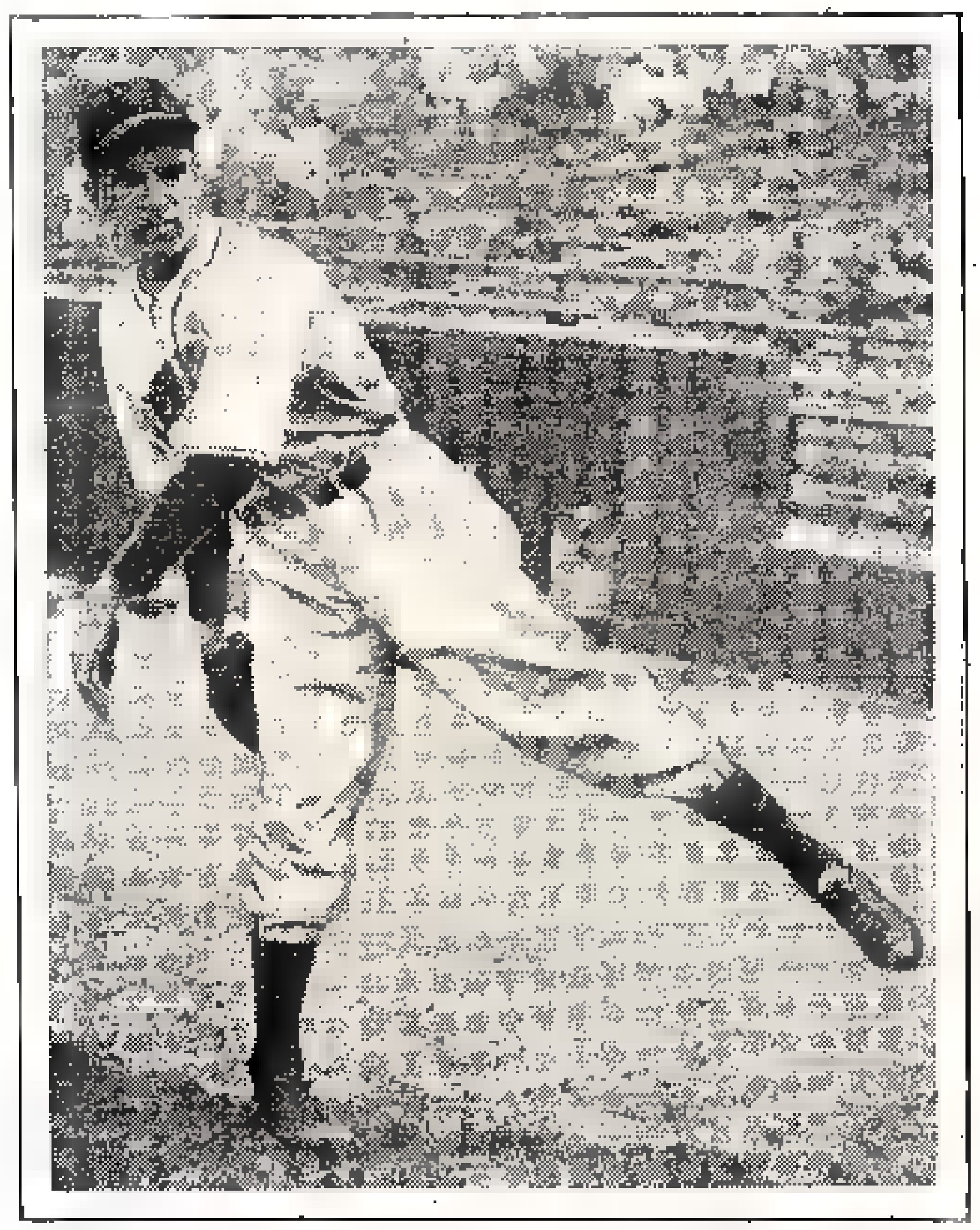
Baseball is not just throwing and hitting a ball. Here stars tell you how a turn of the wrist or the grip [redacted] a bat put them into limelight on major league diamonds.

by JOHN C. HOFFMAN

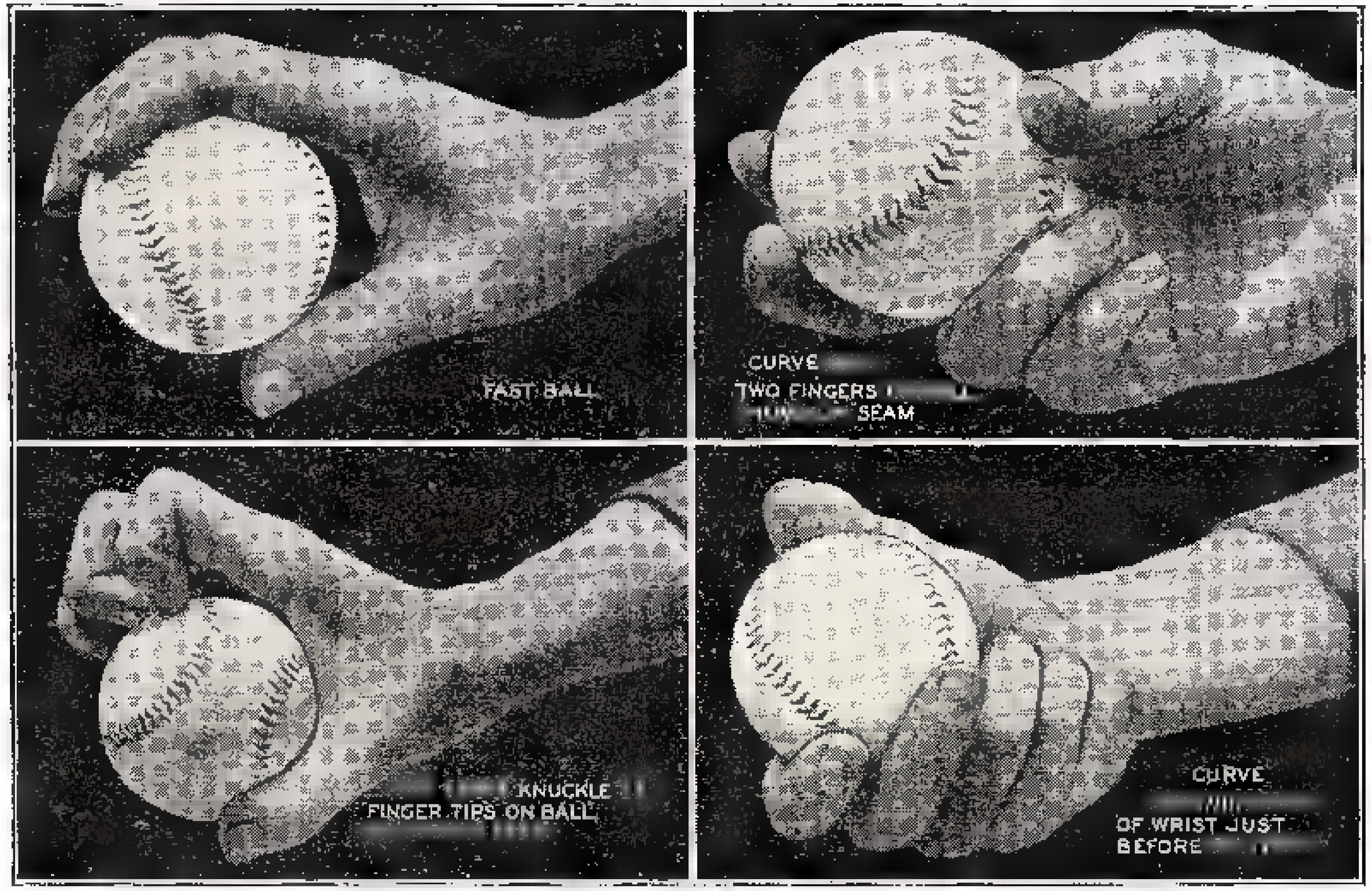
STARS like Babe Ruth, Carl Hubbell, Al Simmons, and Ted Lyons did not walk into the baseball limelight through luck alone. They learned baseball by studying the stars of bygone days. If you want to be a good batter or a good pitcher, let the men at the top of the baseball ladder teach you.

Baseball might be called a sport in which mechanics is important. We might talk about leverage, fulcrum, power, air resistance, and speed, but without getting too technical, let us put the spotlight on the pitcher's grip on a ball, the batter's grip on his bat or his stance at the plate.

Let's see what makes them go, so to speak. Let's see how they hit, throw curved balls, knuckle balls, screw balls and whatnot.


Carl Hubbell, 1933 series hero, pitching for the Giants.

We'll take some of the better known pitchers first. Probably the five most popularly accepted deliveries are the curve ball, the knuckle ball, the fast ball, the slow and the screw ball. Some of the others are the fadeaway, the cross-fire, the fork ball and the downer.


FAST BALL
CURVE [redacted]
TWO FINGERS [redacted]
[redacted] SEAM
[redacted] KNUCKLE [redacted]
FINGER TIPS ON BALL
[redacted]
CURVE
[redacted]
OF WRIST JUST
BEFORE [redacted]

Pitchers' grips for some of the most popular forms of deliveries are illustrated here by Ted Lyons, White Sox [redacted]

Babe Ruth, baseball's great slugger, holds his bat long.

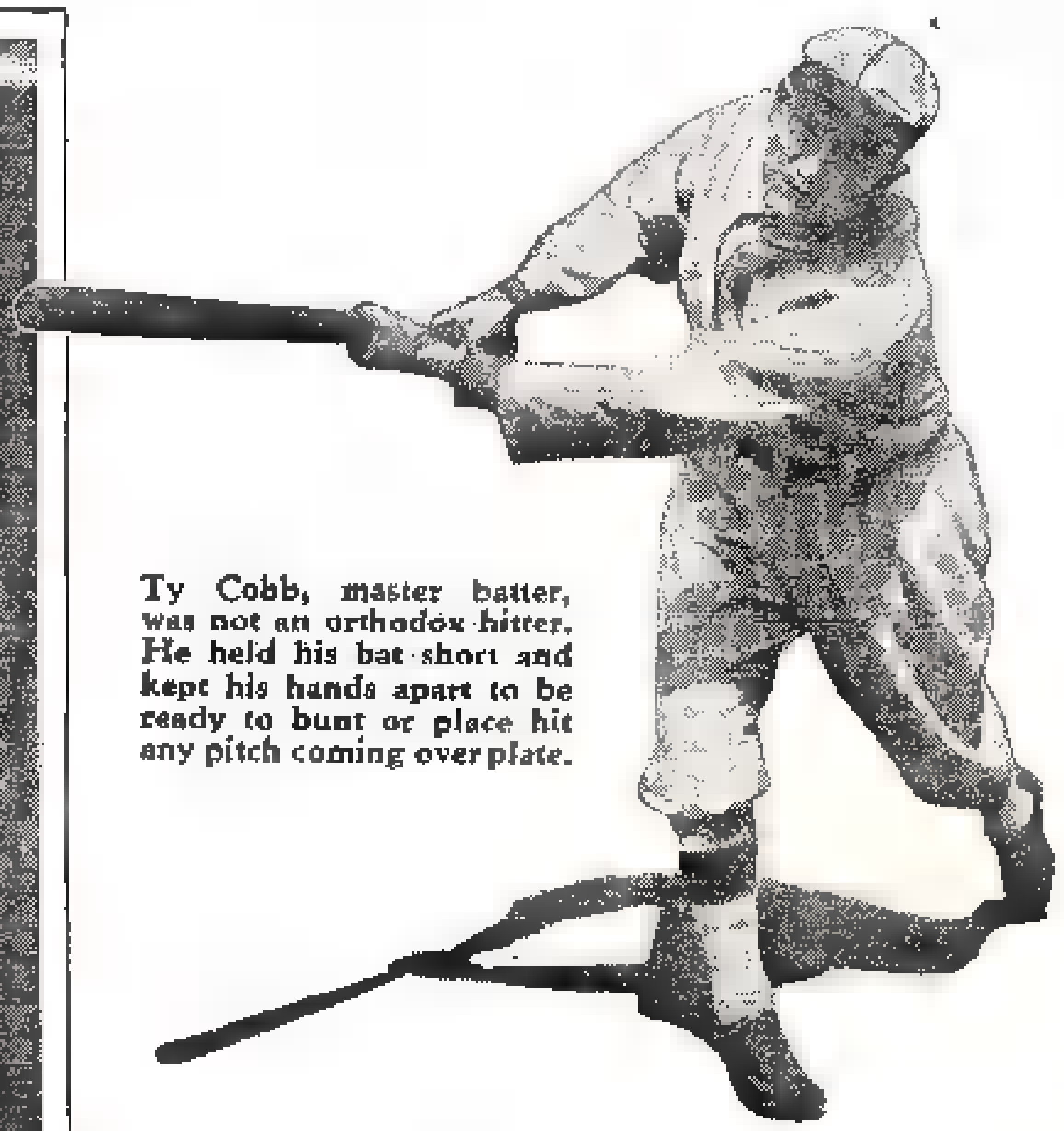
The possession of any or all of these deliveries, however, does not make a great pitcher. A winning pitcher must, of course, have a change of pace, a deceptive delivery, intelligence, courage and last, but most important, control.

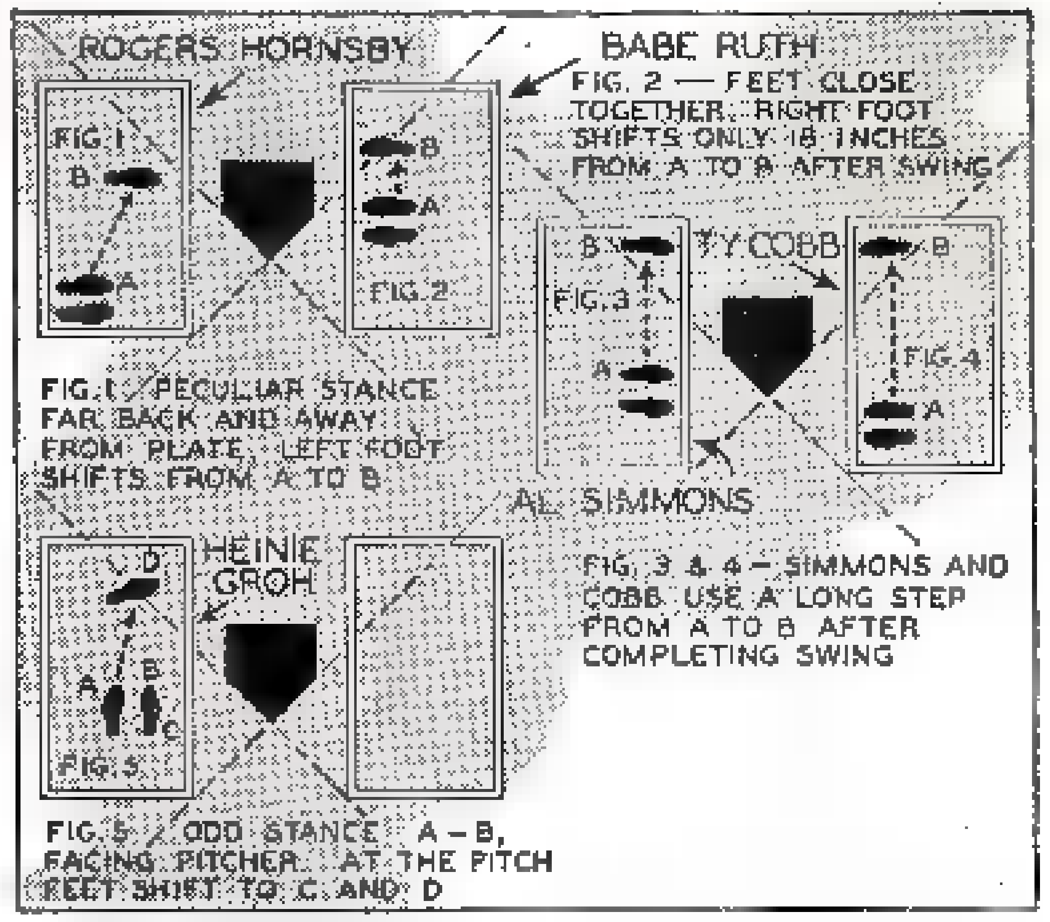
The curve ball is most common and comes in a hundred varieties. Most of them are thrown by placing the first two fingers on the smooth surface of the ball and thumb on the seam. This has [redacted] tendency to slightly retard the progress of one side of the ball while the side under the first two fingers is sliding, thus affecting [redacted] spin and the consequent curve.

Throwing the Knuckle Ball

The slow ball is generally gripped by all five fingers. At the instant of its delivery all five fingers are opened simultaneously so as not to put a spin on the ball. Approaching the batter, the ball thus appears larger and has a tendency to throw the hitter off his stride.

The knuckle ball is [redacted] widely used delivery, but difficult to control. In the majority of cases the ball is held with the thumb and the little finger against the ball and the other three fingers crooked, with the first joints resting against the surface.


Ty Cobb, master batter, was not an orthodox hitter. He held his bat short and kept his hands apart to be ready to bunt or place hit any pitch coming over plate.


ROGERS HORNSBY
BABE RUTH
FIG. 2 — FEET CLOSE TOGETHER. RIGHT FOOT SHIFTS ONLY 18 INCHES FROM A TO B AFTER SWING
FIG. 1
B
A
FIG. 2
B
A
B
TY COBB
B
FIG. 3
A
FIG. 4
A
FIG. 1 PECULIAR STANCE FAR BACK AND AWAY FROM PLATE. LEFT FOOT SHIFTS FROM A TO B
AL SIMMONS
FIG. 3 & 4 — SIMMONS AND COBB USE A LONG STEP FROM A TO B AFTER COMPLETING SWING
D
HEINIE GROH
A
B
C
FIG. 5
FIG. 5 ODD STANCE A – B, FACING PITCHER. AT THE PITCH FEET SHIFT TO C AND D

Various stances at the plate used by great hitters are shown above. Hornsby's and Groh's are most unorthodox.

A notable exception to the custom, however, is Ted Lyons, Chicago White Sox ace, who places the tips of four fingernails on the leather with the thumb pressed on the ball as in the case of the curve ball delivery.

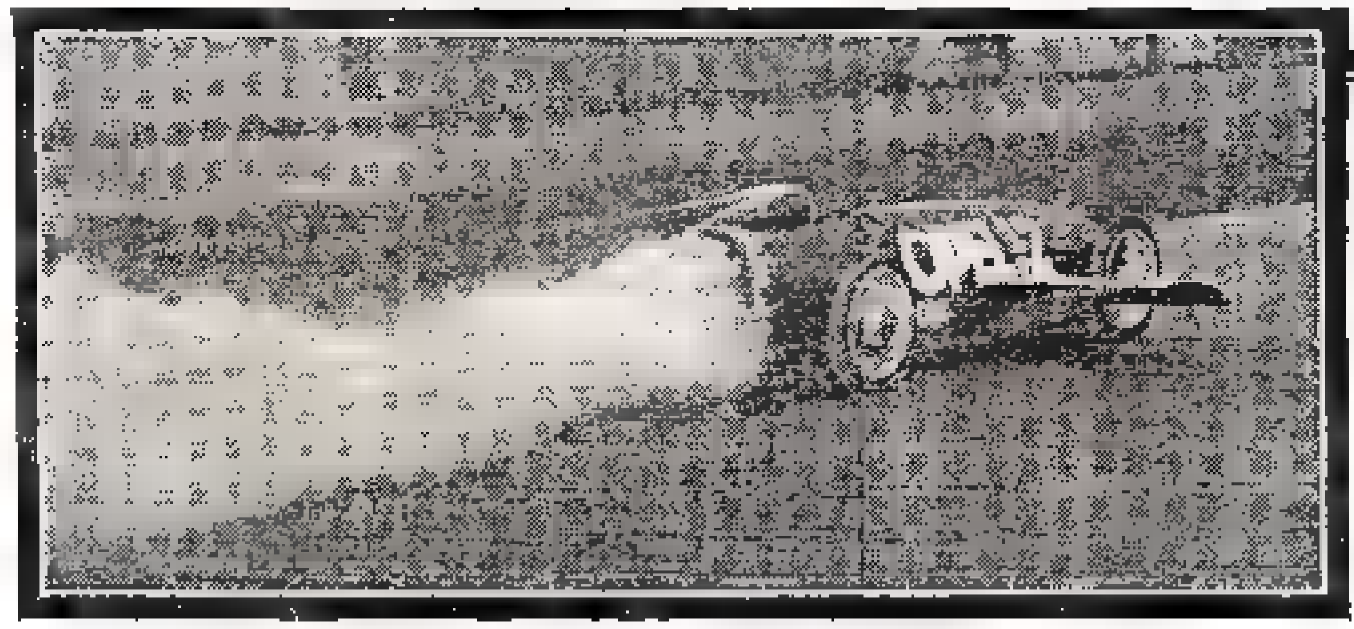
This would seem to make it more difficult than ever to control the ball, but not so with Lyons. Explaining his knuckle ball, he says:

"I find that I can get more of [redacted] break on the ball by gripping it with four fingernails. It took years to develop this delivery. I first experimented with the knuckle ball while still at Baylor University. I had

(Continued on page 135)

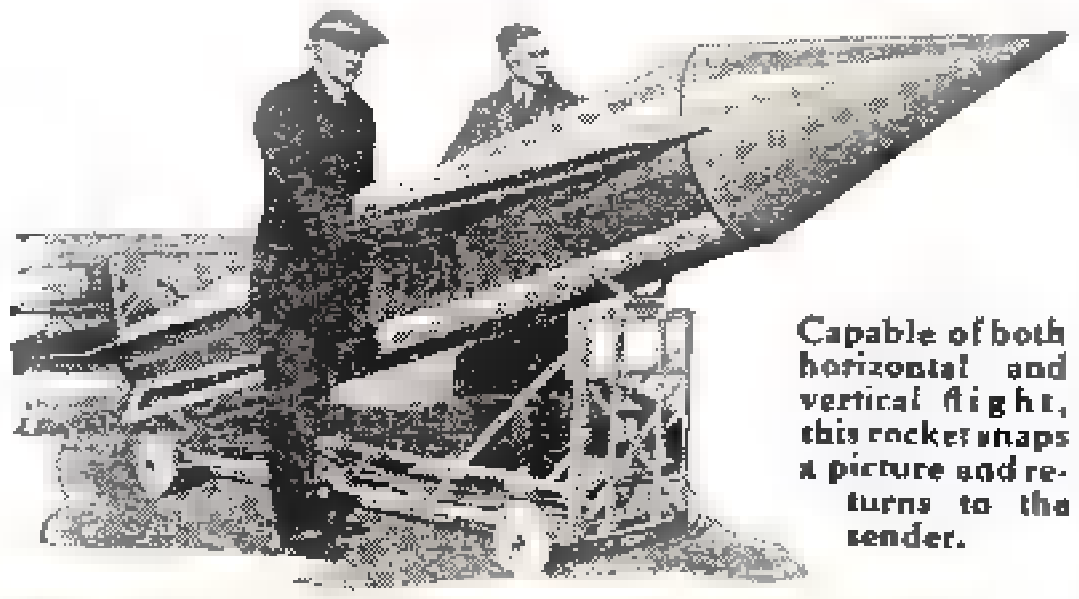
Daring Rocket Men to Invade the STRATOSPHERE

by ALFRED ALBELLI

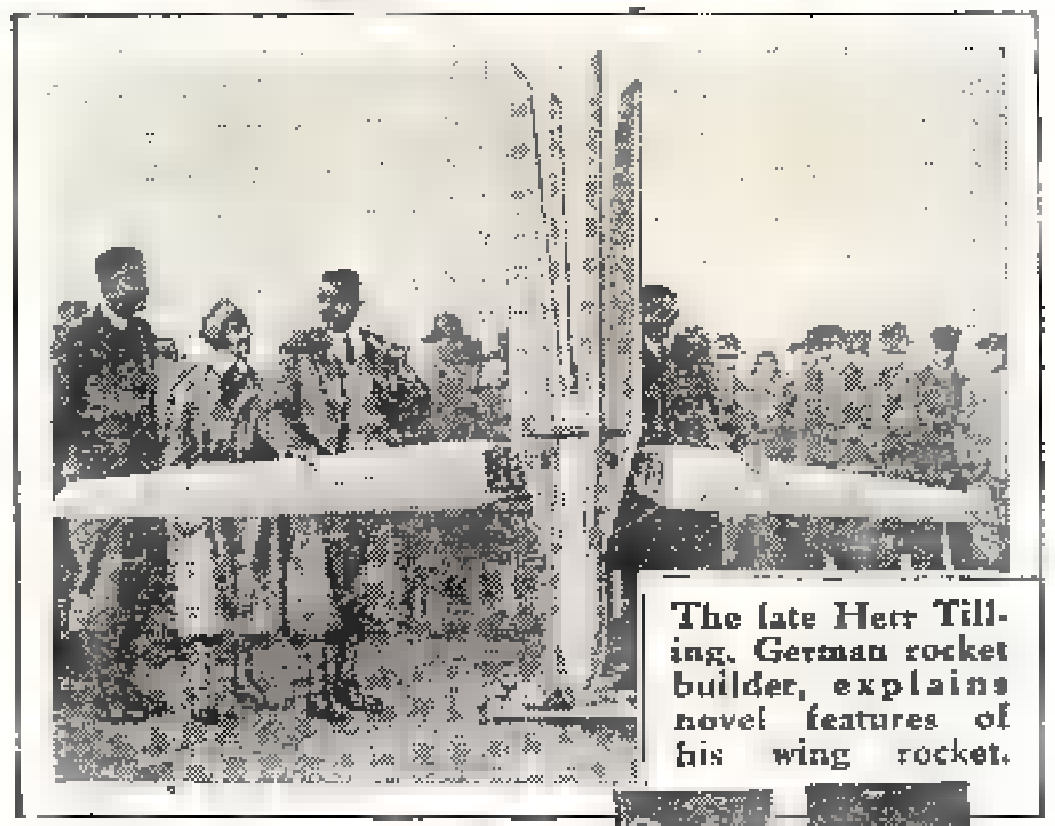


Experimenting with giant rockets, dauntless scientists are planning fresh invasions of the ether. Here is a complete story of their latest projects.

Success of the rocket-driven auto, left, paved the way for conquest of the ether.



Capable of both horizontal and vertical flight, this rocket snaps a picture and returns to the sender.



The late Herr Tilling, German rocket builder, explains novel features of his wing rocket.

Penetration of the stratosphere to a depth of fifteen miles is planned by the Cleveland Rocket Society, here shown conducting a successful test of a new rocket motor. The model motor consists only of a combustion chamber. A highly volatile gas combination is fed through two tubes in the nose. Oxygen is poured through one inlet and gasoline under 250 pounds pressure through the other.

THE rocket-shooters are going to pitch in again this coming summer. Undaunted by reverses and tragedies during the past year's experiments, the rocketeers are tackling their work with renewed vigor and ambition, plus improved apparatus and chemicals.

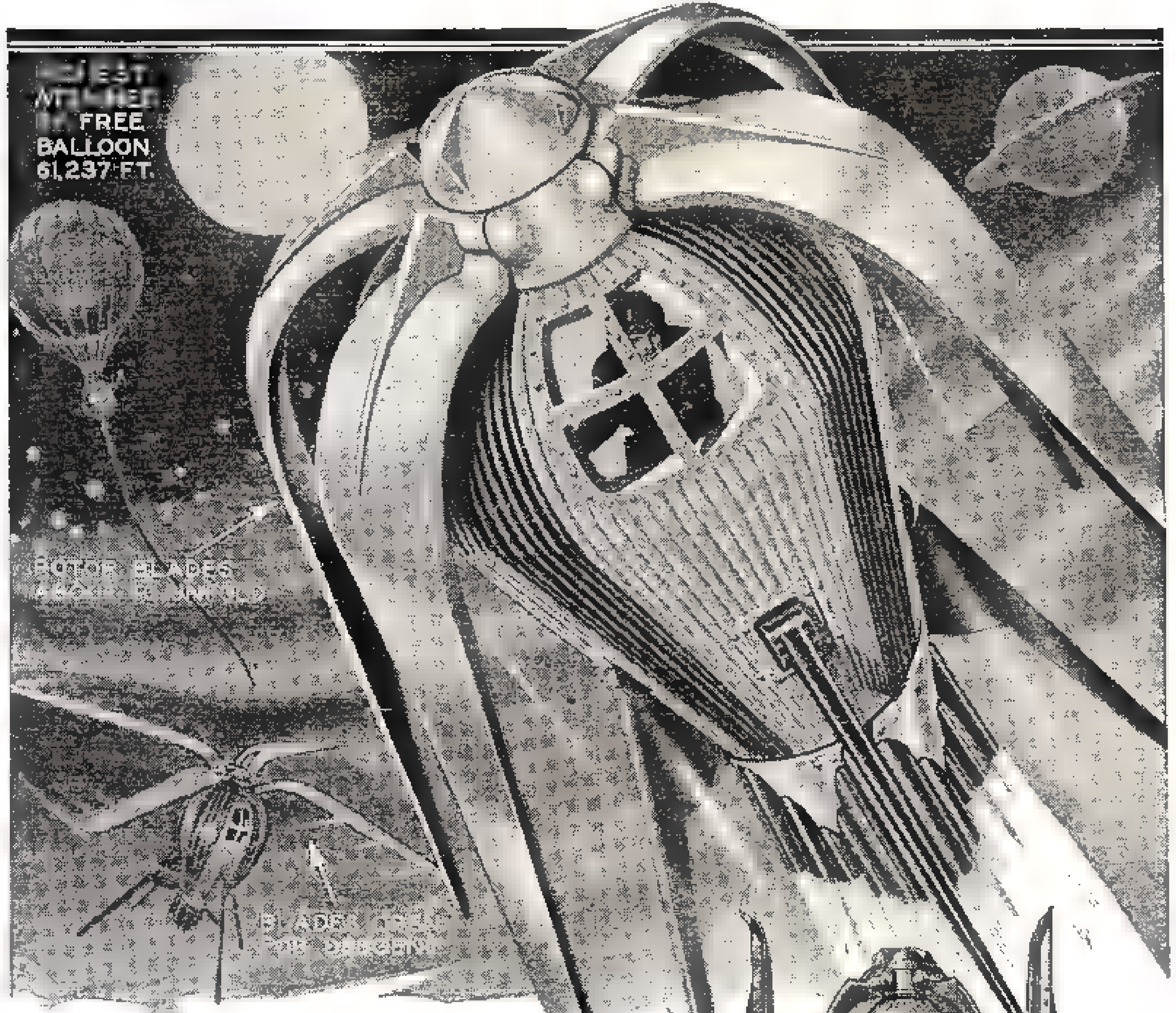
Ernst Loebell, famous German engineer and rocket designer, promises to bring the rocket engines to their greatest point of achievement next summer. He is now in this country and is an active worker in the Cleveland Rocket Society.

Loebell has been carrying on his preliminary experiments on the big Hanna estate in a suburb of Cleveland. In their operations the Cleveland group has been making use of the lessons taught by the experiments of Loebell's countryman, the late Reinhold Tilling, a noted radio engineer and rocket builder.

Prior to his death, Tilling had been experimenting with rockets and rocket planes for months. The success of a rocket which reached a height of 6,000 feet in 1931 spurred him on to the construction of a rocket with glider wings which unfolded when the fuel was exhausted and brought the projectile gently to earth. This feat was hailed as one of the first practical steps toward the development of mail and passenger carrying rockets.

The Tilling rockets were set in motion by telignition from a distance of 100 yards. They attained a speed of 700 miles an hour and landed five miles from the starting point, in accordance with calculations. Herr Tilling was working on a system designed to manipulate his rockets by radio control when he and a female assistant were killed in the explosion of a rocket which they were charging.

Such information as emanated from the secrecy surrounding Tilling's operations at Osnarbrueck, Germany, has since been in the possession of the Cleveland Rocket Society's guiding geniuses. They plan to adopt the Tilling heritage and carry his work to further perfection.



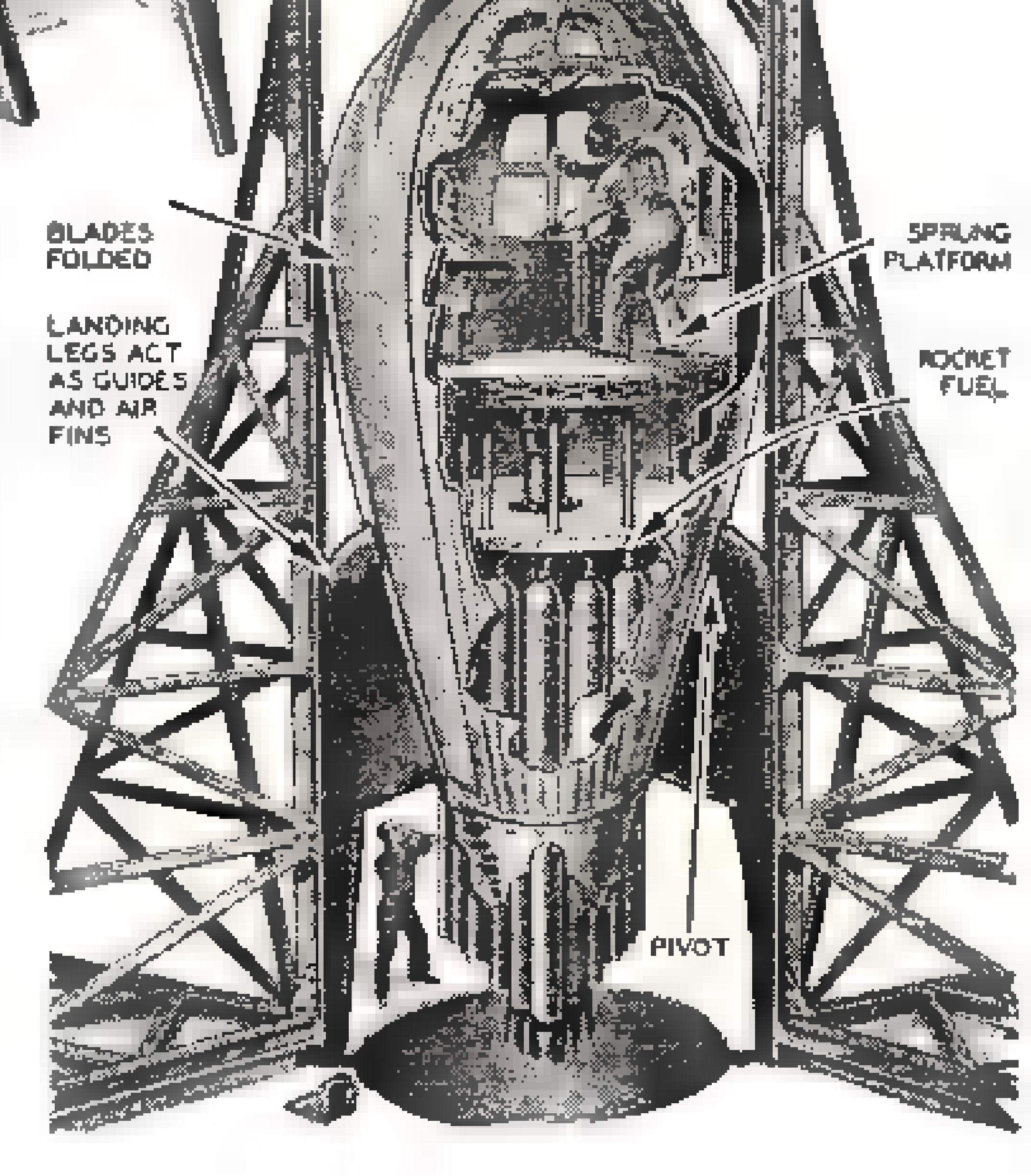
An artist's conception of the man-carrying rocket of the future. Note autogyro vanes which float the rocket back to earth when power is spent, allowing it to settle gently on landing fins.

Ernst Loebell and his assistant, Ted Hanna, have also investigated another secret German rocket—that of the famous Fischer brothers, details of which have also been closely guarded. The Fischers have achieved the biggest advance thus far in the field of passenger rocket flying.

The Fischers pursued their experiments on the island of Rugen in the Baltic Sea under the auspices of the German War Ministry. Otto Fischer, brother of Bruno, who designed the rocket, was shot up 32,000 feet, more than six miles, into the air in a 24-foot steel projectile.

At the peak of the rocket's trajectory, Otto released a parachute attached to the

(Continued on page 118)



Study Clouds to FORECAST *W*EATHER

by DR. W. J. HUMPHREYS
U. S. Weather Bureau
Washington, D. C.

Predicting weather is not at all hard if one watches Mother Nature's weather signals. The clouds, the sun, the air, the wind, even the moon and stars have stories to tell if one watches them carefully.

White, fleecy cumulus clouds, casting no shadows, with blue sky visible between the patches, mean fine weather. When seen near the horizon, as above, they are somewhat flattened.

WE HAVE all, at some time or other, taken a turn at predicting tomorrow's weather, with varying successes. We have marveled at mariners, farmers, or woodsmen who become quite expert at forecasting weather, and wondered how they did it.

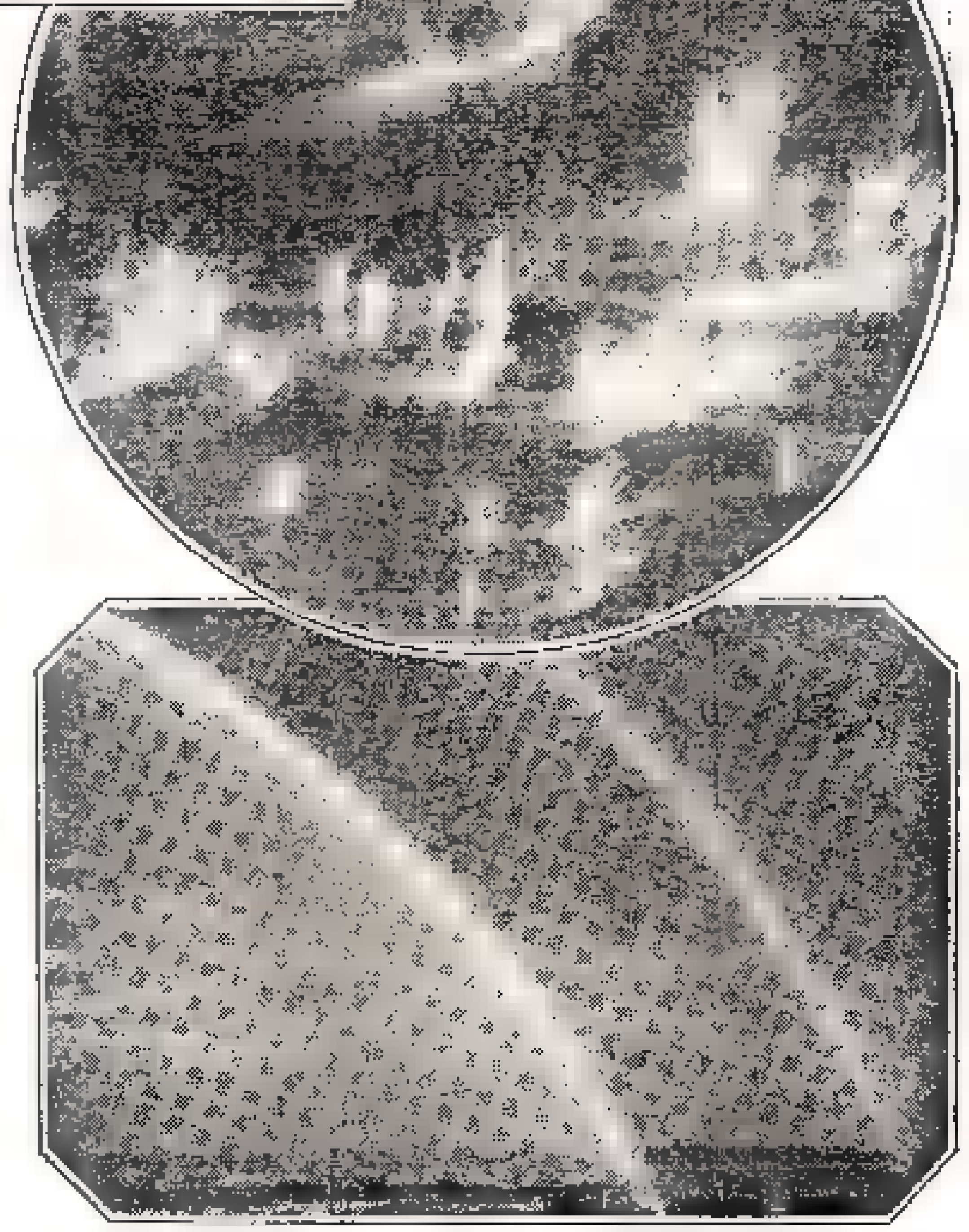
It is the simple weather signs for which these amateur prophets look, signs which can be interpreted by anyone. Only these obvious indications will therefore be discussed here.

This article, of course, cannot make you an infallible weather prophet — nothing can be so fickle as the weather. With all the latest scientific equipment at its disposal, the Weather Bureau is only 85 per cent correct, and it figures it is doing right well at that.

Four Types of Clouds

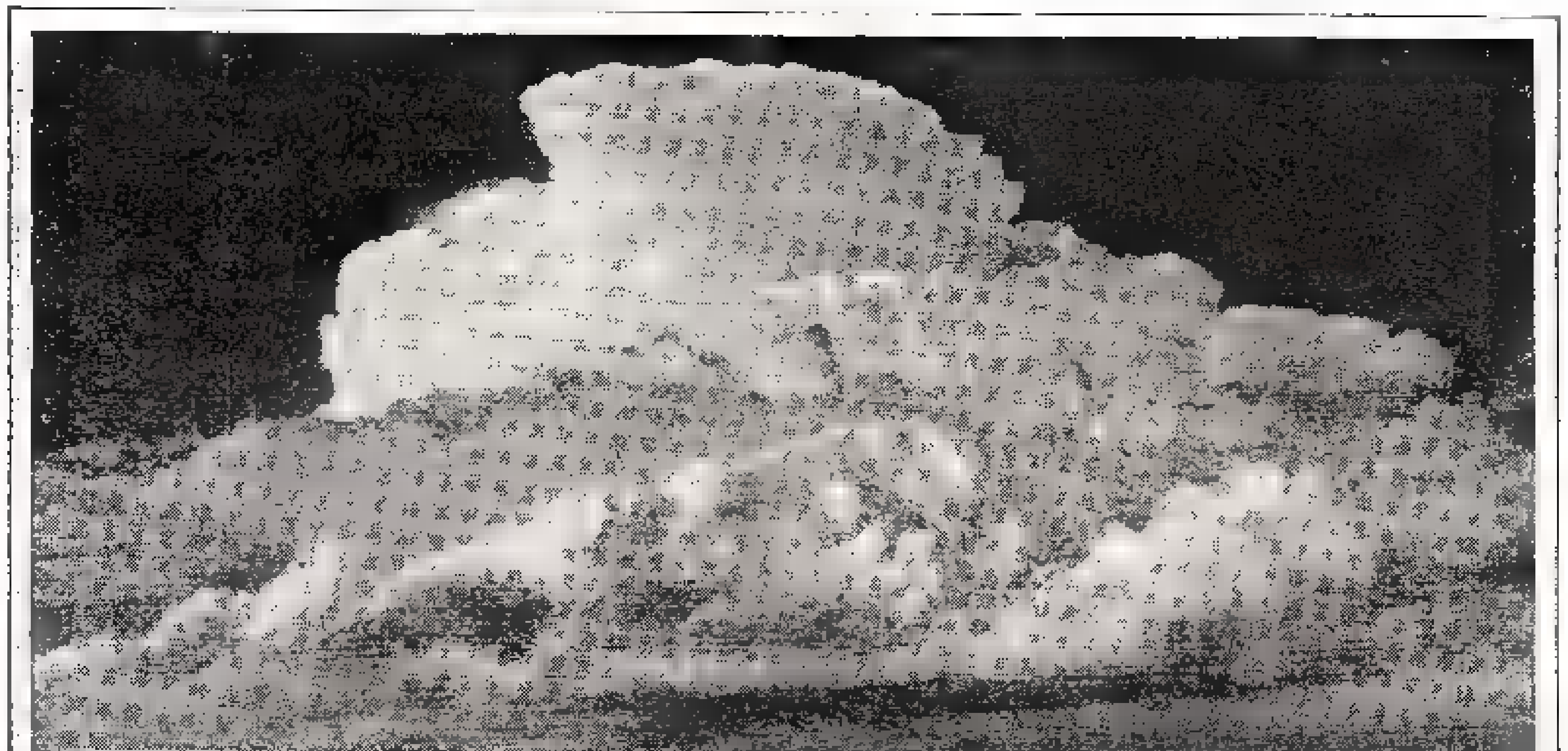
Clouds are the most obvious weather signs and are easily read when one learns their language. There are four major classifications of clouds — cirrus, cumulus, stratus and nimbus with 27 combinations of these types. Cirrus clouds are featherlike, cumulus clouds resemble a wad of cotton, stratus clouds come in layers, and nimbus clouds are of no special shape but merely those from which rain or snow is actually falling, although sometimes the precipitation evaporates before it reaches the ground. Keeping these descriptions in mind, and referring to the photos shown here, it should be simple to identify the various types.

Everyone has noticed droplets condense on the outside of a pitcher of ice water. The same thing occurs when a cloud is formed—the moisture in the air is condensed when the air becomes cool enough, and these tiny drops become visible as clouds. Since clouds are evidence of moisture in the air, a cloudless sky is a sure sign of fair weather.

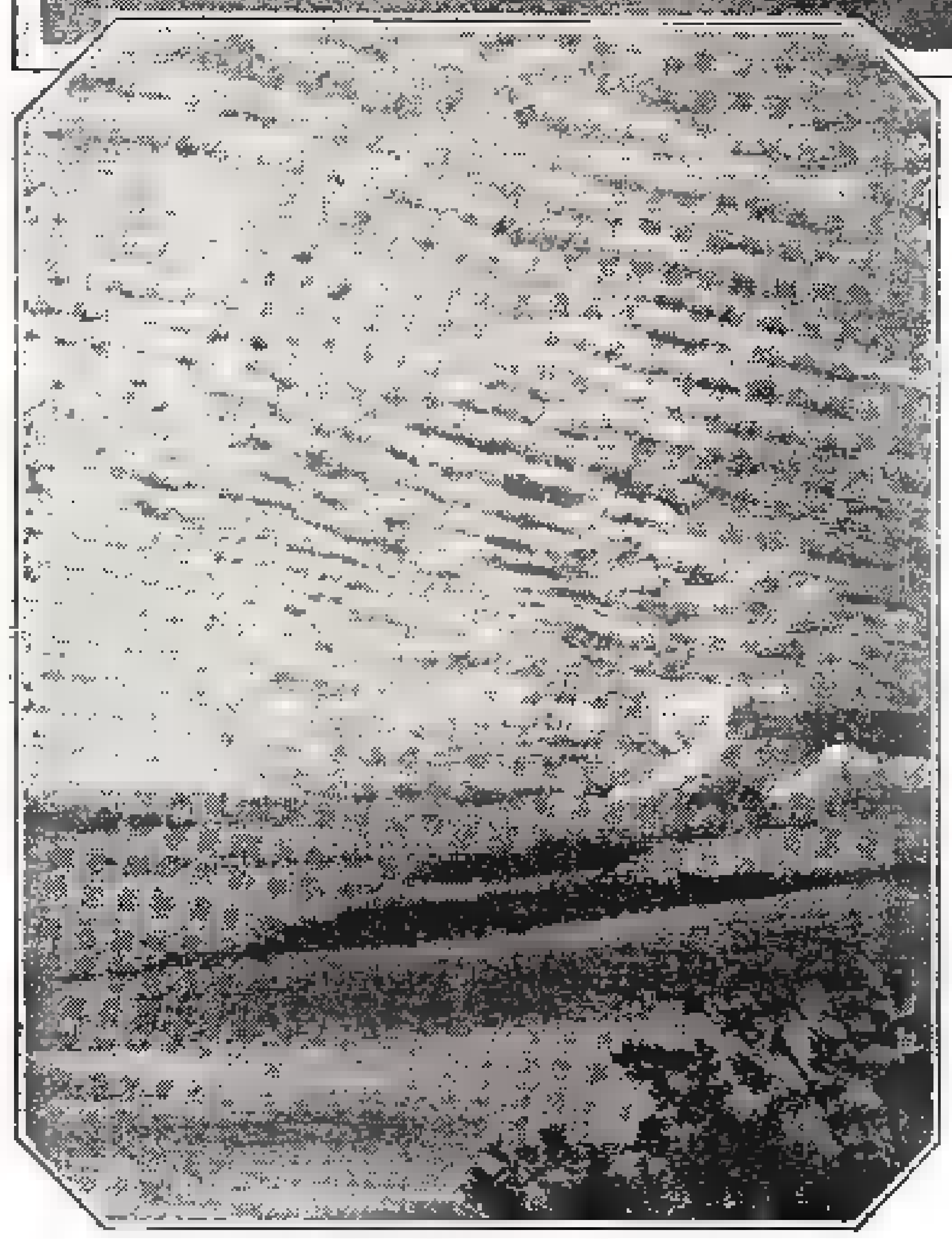


In circle: "Mares' Tails" cirrus cloud photograph taken 36 hours before storm came. These are high and feathery. Below: Rainbows are of value only in predicting weather for the same day. If in afternoon, they mean fair weather.

Small scattered cumulus clouds also denote fair weather. These clouds are white and fleecy, and when seen near the horizon they are plainly somewhat flattened. Sometimes they appear as large patches of stratocumulus, but if they are soft and woolly, casting no shadows, and with the blue sky visible between the patches, they still mean fair weather.



Large cumulus clouds indicate showers. When anvil-shaped mass shown above appears above the towering cumulo-nimbus cloud formation, hail or thunderstorms are probable.



"Mackerel Sky" cirrus clouds, and similar feathery formations, forecast a storm which may be several days away. They indicate high winds, probably accompanied by rain.

High feathery clouds are usually the forerunner of a storm, although the storm may be several days away. These cirrus clouds often take the form of "mackerel scales and mares' tails," and indicate high winds, which will probably be accompanied by rain. Often two layers of clouds may be seen moving in different directions—a sure sign of a rapidly approaching storm.

While small cumulus clouds mean fair weather, large clouds of the same type indicate rain, usually showers. Often billowy white clouds may be seen on the horizon, the tops towering to enormous heights. These are caused by rising currents of air a condition necessary for thunder storms. When an anvil-shaped mass appears above these towering cumulus clouds conditions are ripe for a hail storm.

Clouds May Resemble Waves

Occasionally cumulus clouds take the form of a wave breaking on the sea shore, forming a long line that seems to be rolled along. This is known as a line squall. It indicates the meeting of winds from opposite directions, causing strong ascending and descending air currents, and will invariably be accompanied by violent showers, high winds, and a considerable drop in temperature.

Dark, low, ragged clouds indicate bad weather, usually a long period of steady rain. This type is known as nimbus, and is usually without any definite shape. Often such clouds will be present a long time before rain actually starts to fall, or the rain may cease though the shapeless gray mass of cloud persists for some time.

(Continued on page 120)

WHAT'S WRONG With UNCLE SAM'S NAVY?

by

Lieut. John Edwin Hogg, U.S.N.R.

Lieutenant John Edwin Hogg, U.S.N.R., author of this article, has just completed a tour of duty with the fleet in Pacific waters and the facts he learned are well told. He backs up his "bigger Navy" plea with concrete reasoning.

(NOTE: *The views and opinions expressed herein are those of the author and should not be construed as reflecting the official views or opinions of the Navy Department.*)

A naval officer frankly discloses just how badly American defense has suffered through inadequate building program.

AS THESE lines are written the American navy is in the worst condition of decrepitude and impotence that has ever marked its history.

Pacifist domination and sheer neglect has left us with a navy so skeletonized and anaemic as to threaten our national security. Among some none-too-friendly neighbor nations armed to the teeth and in a world seething with social, political, and economic unrest, we find ourselves with a run-down battle fleet that is only 65 per cent of the estimated strength necessary for national defense. Moreover, this precariously weakened "first line of national defense" is only 85 per cent manned!

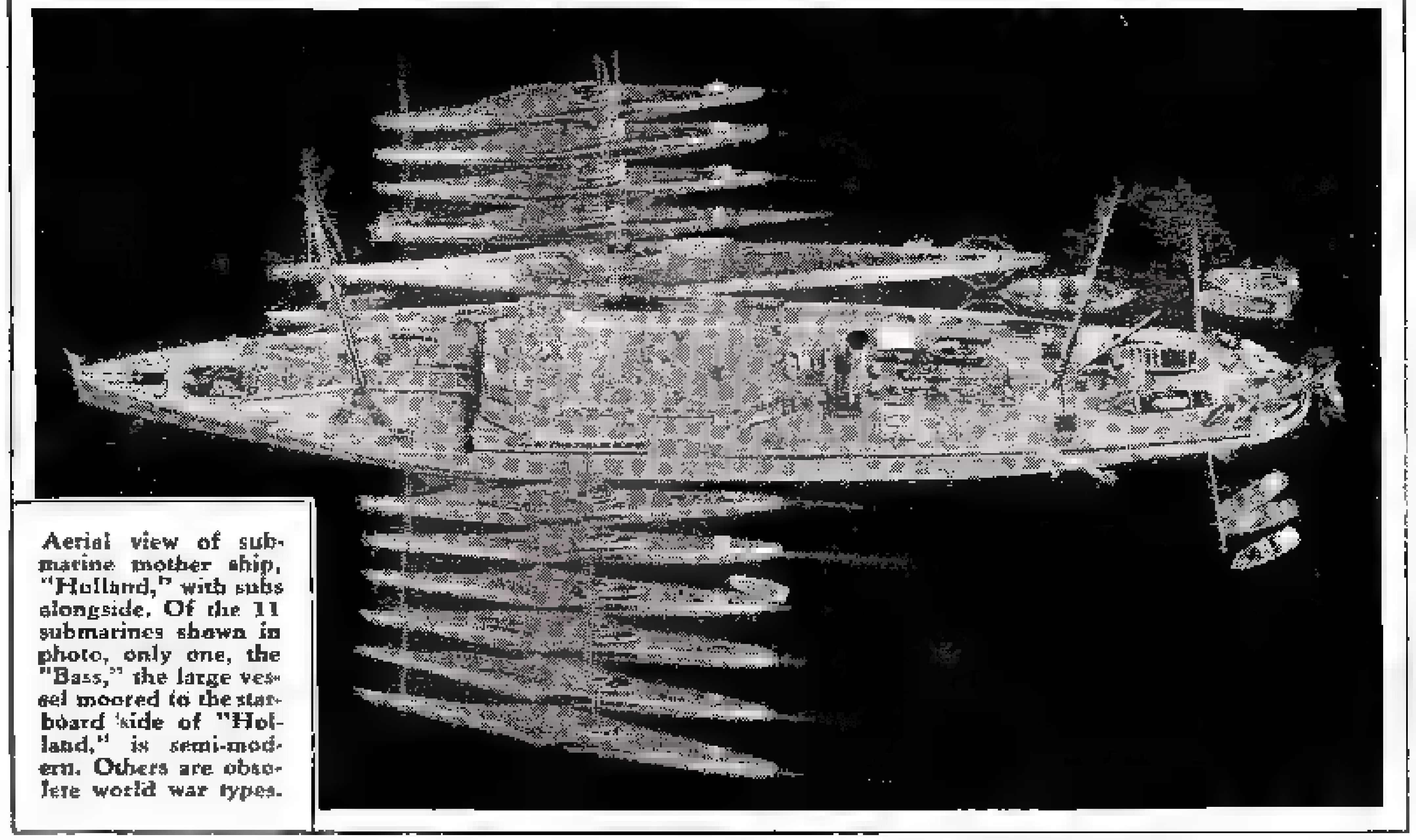
The Roosevelt administration is striving desperately "to do something about it." Recently congress fired a heartening broadside by assuring appropriations for new ships that will bring the U. S. Navy up to full treaty strength. Into these vessels will go improvements in design, speed, gunfire and cruising range developed since the World War. In the air the navy will augment both its offense and defense. A third aircraft carrier, floating a new swarm of planes plus large caliber anti-aircraft weapons and new machine guns will further bolster the defense.

The close of the World War found the leading nations financially impoverished, sick of war, and plunged into a new competitive race of armament building. This country made an honest and sincere effort to influence the other nations to make drastic reductions in both military and naval armament. To that end we called the Washington Naval Conference of 1922. So enthusiastically did we plunge into that conference that in the words of the late Admiral William A. Moffett, who went to his death in the wreck of the airship *Akron*, "Uncle Sam lost everything but his shirt tails when he signed the Washington Treaty."

As a gesture of our peaceful intentions toward Japan and other nations of the

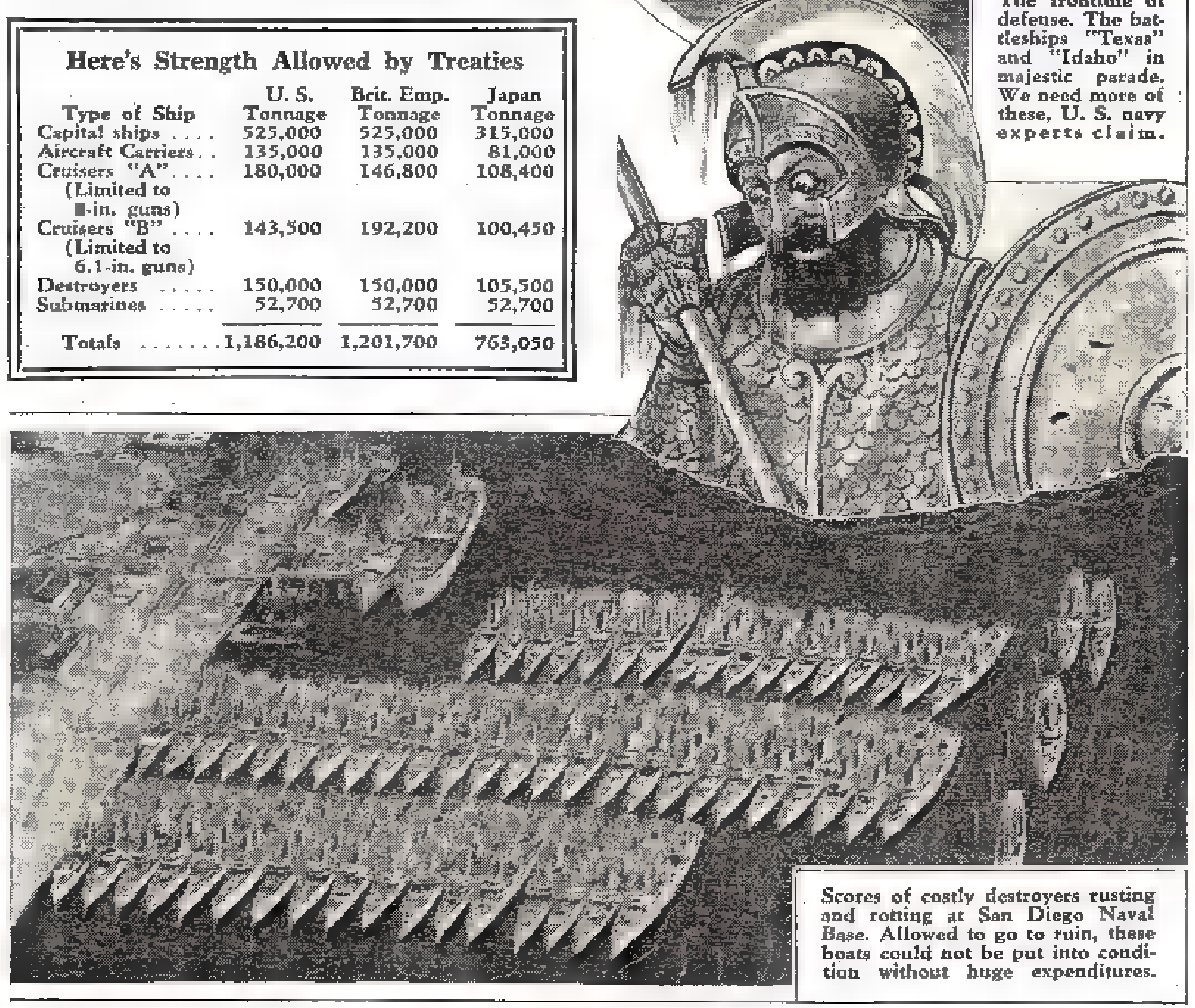
Here's Strength Allowed by Treaties

Type of Ship	U. S. Tonnage	Brit. Emp. Tonnage	Japan Tonnage
Capital ships	525,000	525,000	315,000
Aircraft Carriers . .	135,000	135,000	81,000
Cruisers "A" .... (Limited to 8-in. guns)	180,000	146,800	108,400
Cruisers "B" .... (Limited to 6.1-in. guns)	143,500	192,200	100,450
Destroyers	150,000	150,000	105,500
Submarines	52,700	52,700	52,700
Totals	1,186,200	1,201,700	763,050



Aerial view of submarine mother ship, "Holland," with subs alongside. Of the 11 submarines shown in photo, only one, the "Bass," the large vessel moored to the starboard side of "Holland," is semi-modern. Others are obsolete world war types.

The frontline of defense. The battleships "Texas" and "Idaho" in majestic parade. We need more of these, U. S. navy experts claim.



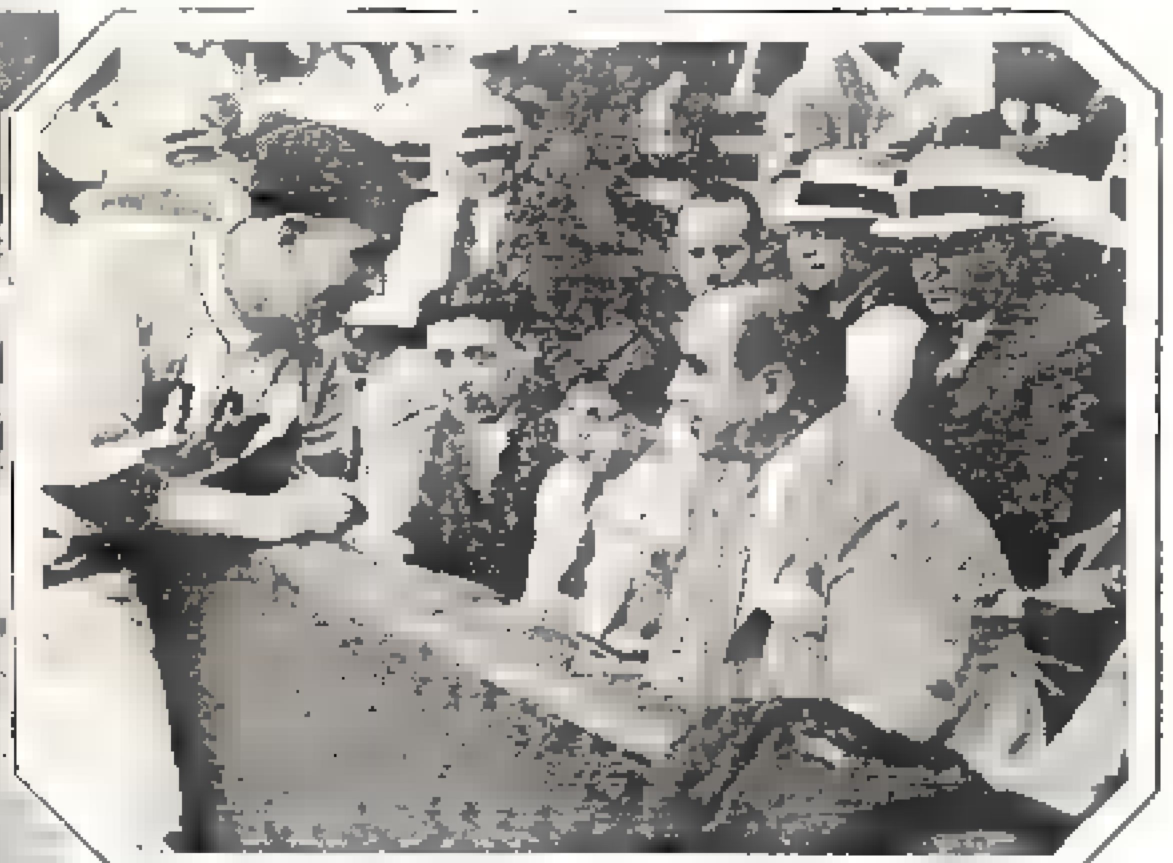
Scores of costly destroyers rusting and rotting at San Diego Naval Base. Allowed to go to ruin, these boats could not be put into condition without huge expenditures.

Bodyguards Face DEATH to End KIDNAP MENACE

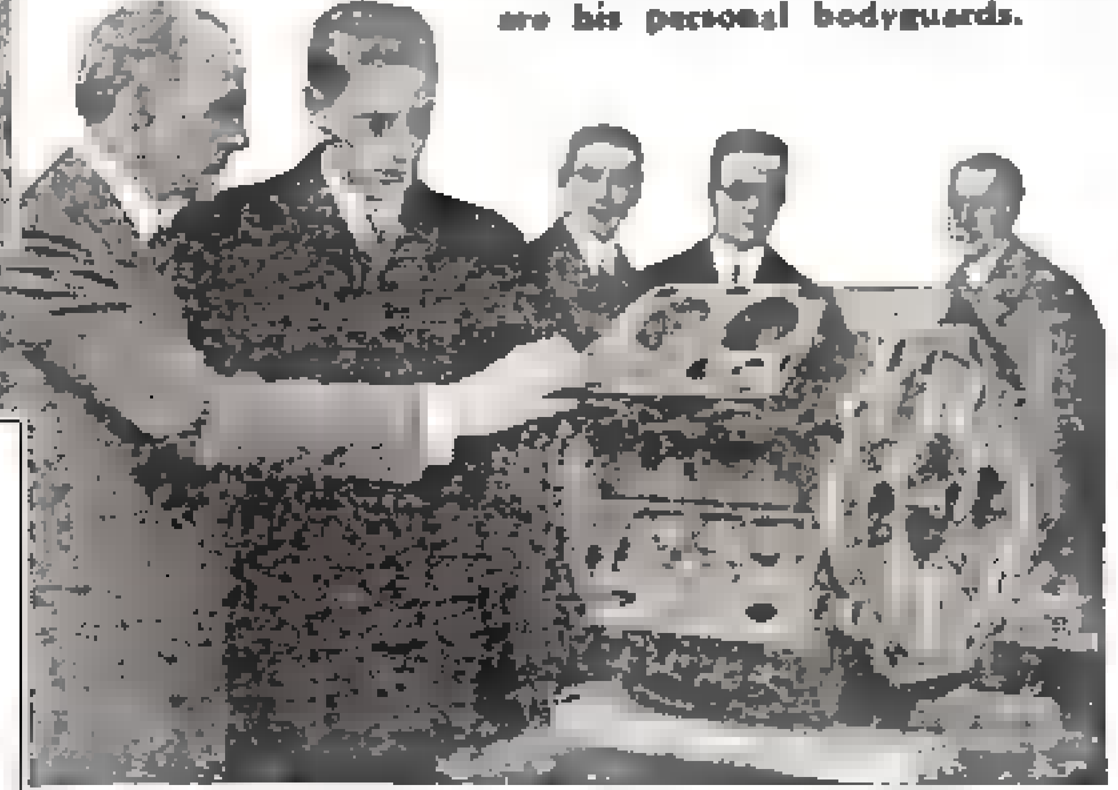
by HARRY BERNSTEIN

Unique and dangerous profession springs into being as the rich seek protection against gangsters. Personal guards must be capable of putting up battle or sipping tea in fashionable drawing rooms of social elite.

General and Mrs. Cornelius Vanderbilt go strolling down Fifth avenue on a joyous Sunday morning. Not far behind you will note a husky bodyguard.



Here's the boy who started the bodyguard industry on its way to prosperity. "Scarface Al" Capone, formerly of Chicago, but now of Atlanta, enjoying a ball game. Beside him is his son, Al, Jr. The ball player is Gabby Hartnett. Some of the men behind Capone are his personal bodyguards.



Henry Ford shows Prince Nicholas, of Rumania, what makes it run. But in the background are the ever present bodyguards. The two in dark clothes watch the Prince, while the one on the right shadows Ford wherever he goes.

John D. Rockefeller, Jr., (carrying valise), travels a good deal, but never without a physically competent and alert bodyguard. The bodyguard, as shown in this picture, constantly keeps an eye trained on all those nearby.

Great Britain takes necessary measures to protect its prime minister, J. Ramsay MacDonald. Leaving St. James Palace, Premier MacDonald is trailed by a corps of bodyguards.

President Roosevelt is under constant watch by an entire squad of secret service operatives. But he also has his personal bodyguard, shown at right.

Children of wealthy persons are under heavy guard these days, due to the many kidnaping attempts that have been made in recent years. The baby son of Samuel Insull, Jr., is never permitted to leave the house unless his nurse is accompanied by a bodyguard, as shown in this picture.

IN THE ordinary run of things, a man does not go about looking for trouble. But this is not the case with a new type of professional men. They are called bodyguards. Trouble is their business--and death not infrequently is their reward.

A bodyguard—and there are thousands of them employed throughout the country today, since the growth of kidnaping and the advent of gang terrorism—must be ever on the alert to forestall tragedy. He must grapple with cranks, fend off kidnapers, shoot it out with a would-be assassin—even offer his own body as a target in order to protect the man or woman under his care.

Perhaps you recall the attempt to assassinate President Roosevelt in Miami, Florida. You will also remember that within a few seconds after the shots were fired, the President found himself surrounded by a wall of human protection. Any more bullets would have had to drill through some faithful guard before reaching the chief executive.

A few years ago, the President of the United States and certain very high governmental officials were the only ones who enjoyed the company of bodyguards. But such is the pathway of modern civilization that today almost every man of wealth or political importance feels unsafe unless his very tracks are dogged by a faithful and physically powerful servant.

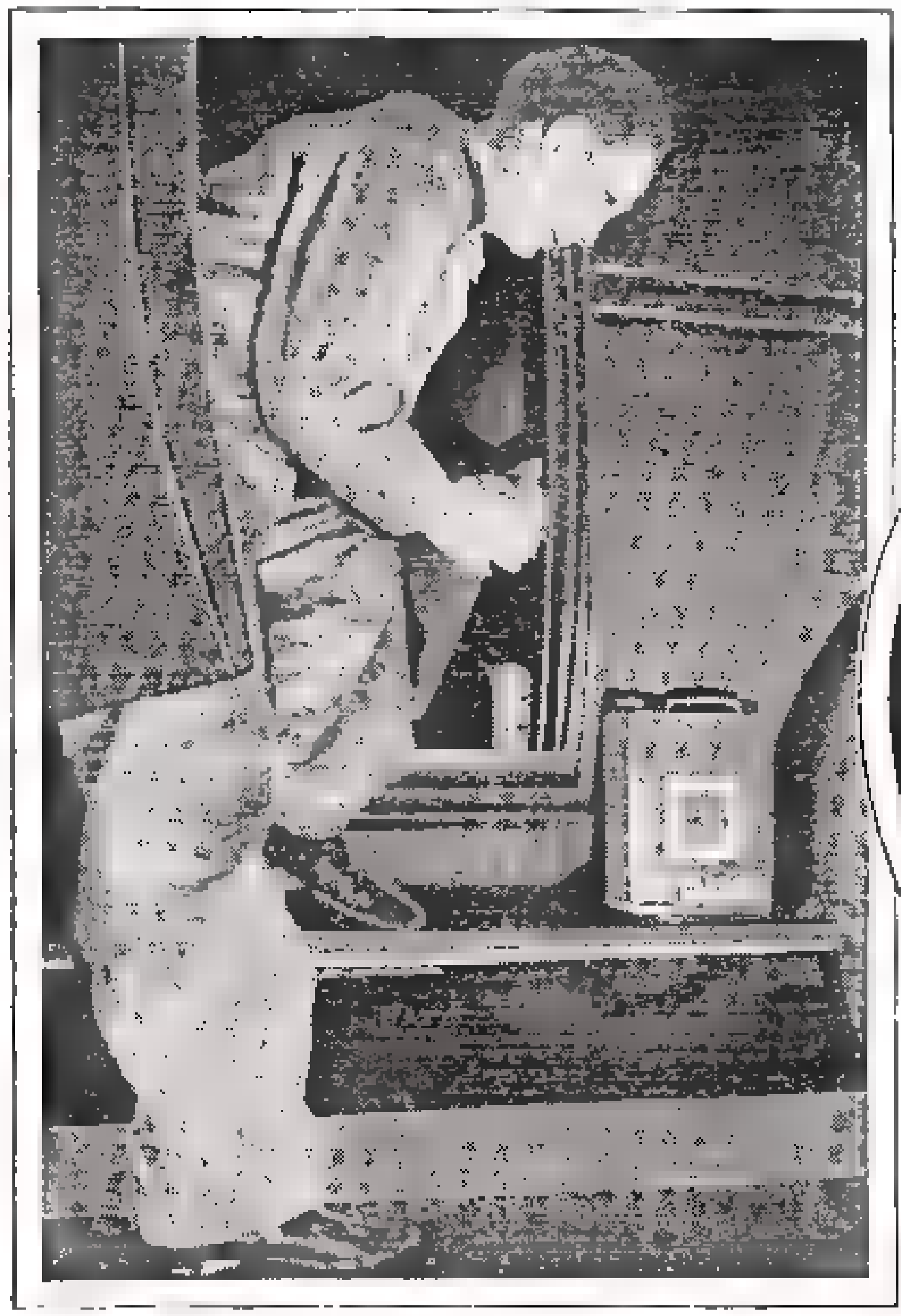
The personal bodyguard is a direct product of the era of gangland. Big shots of the underworld, like Al Capone, started the fad as a means of self protection against rivals.

Then, when the gangsters turned to the lucrative pastime of kidnaping wealthy men and women and holding them for ransom, the employment of bodyguards

(Continued on page 120)

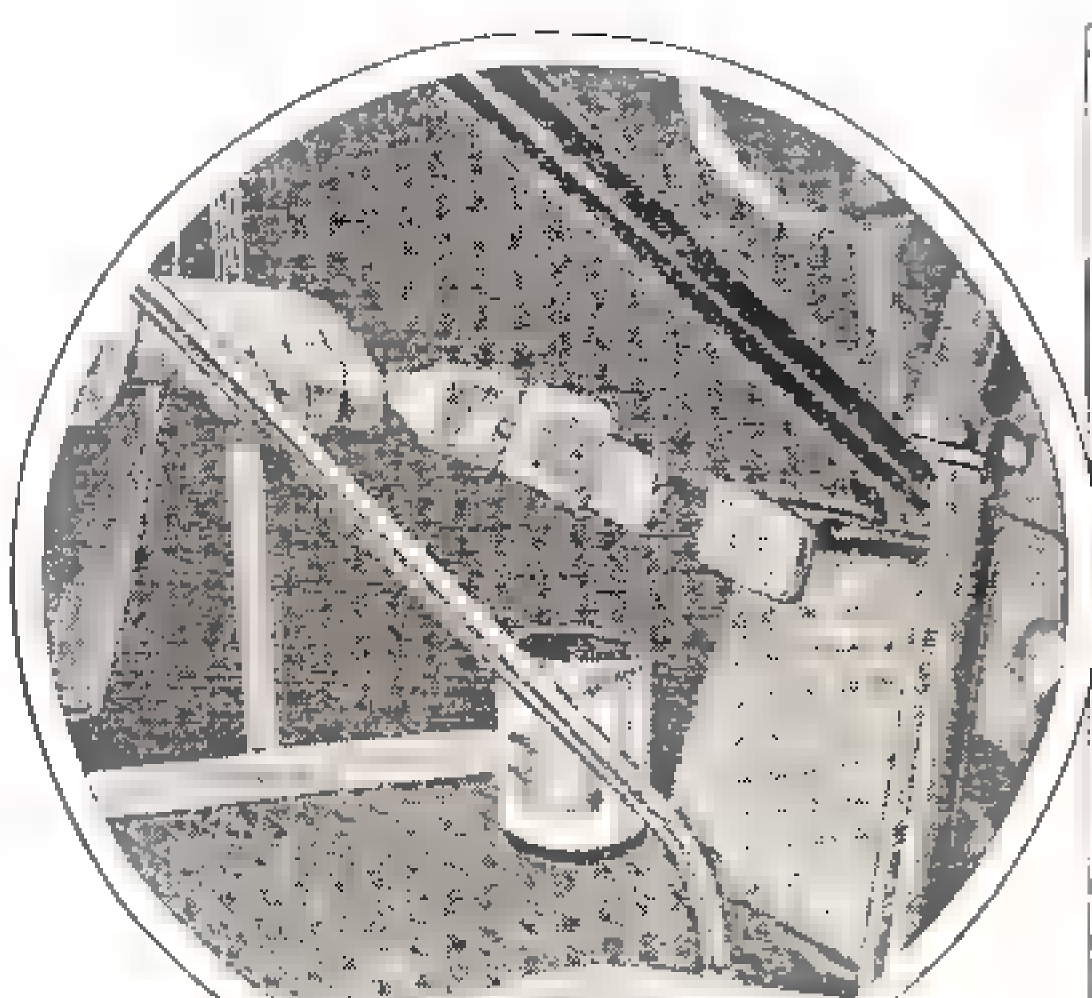
Timely TIPS for TUNING UP YOUR CAR This Spring

Tune up the motor, tighten loose frame bolts, clean off the winter's mud, and the old bus is ready for spring driving.

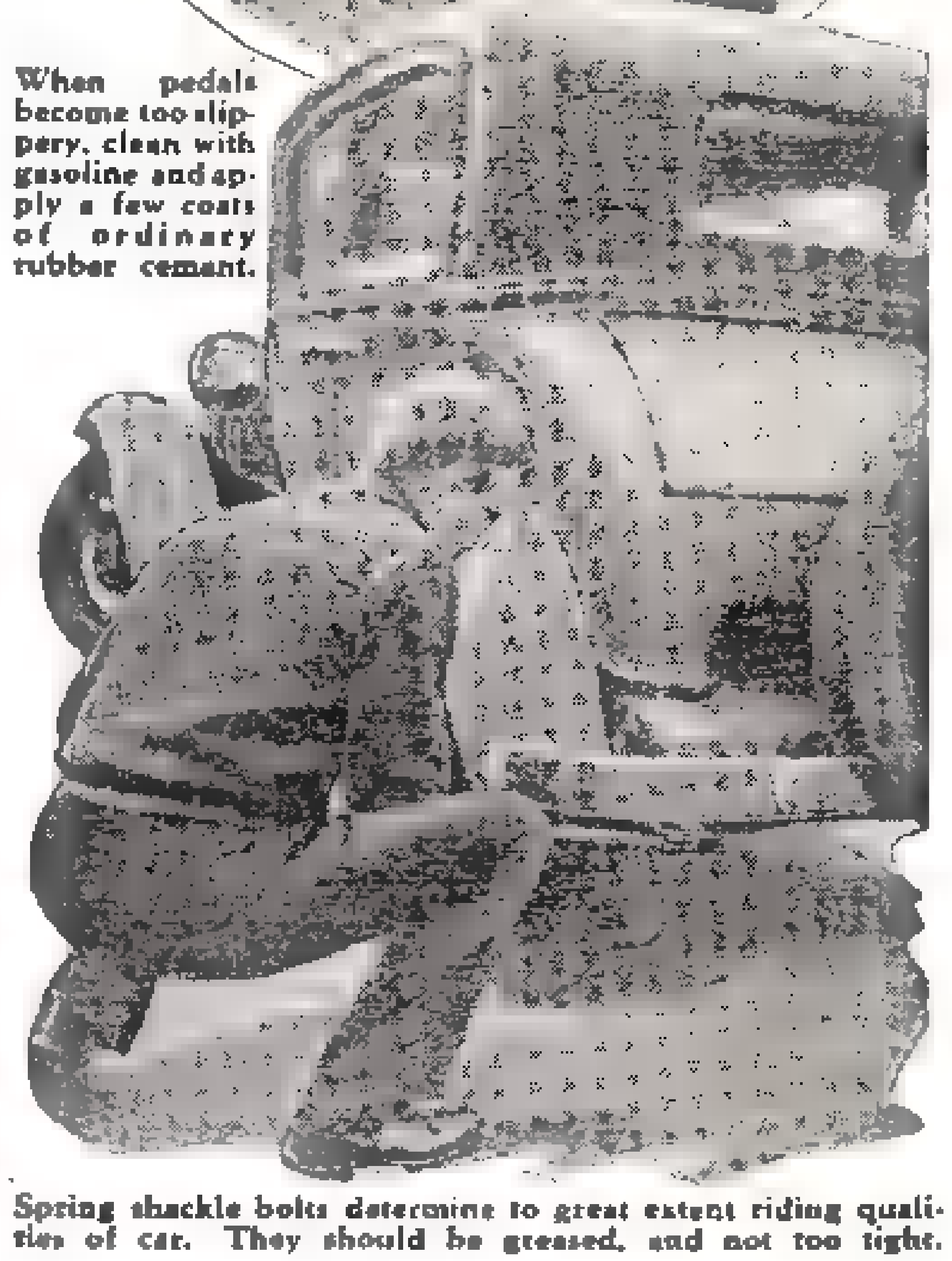


Squeaks and rattles in the doors disappear when pieces of inner tube rubber are cemented over the old rubber door buffers. Upper right—Tightening body bolts in chassis.

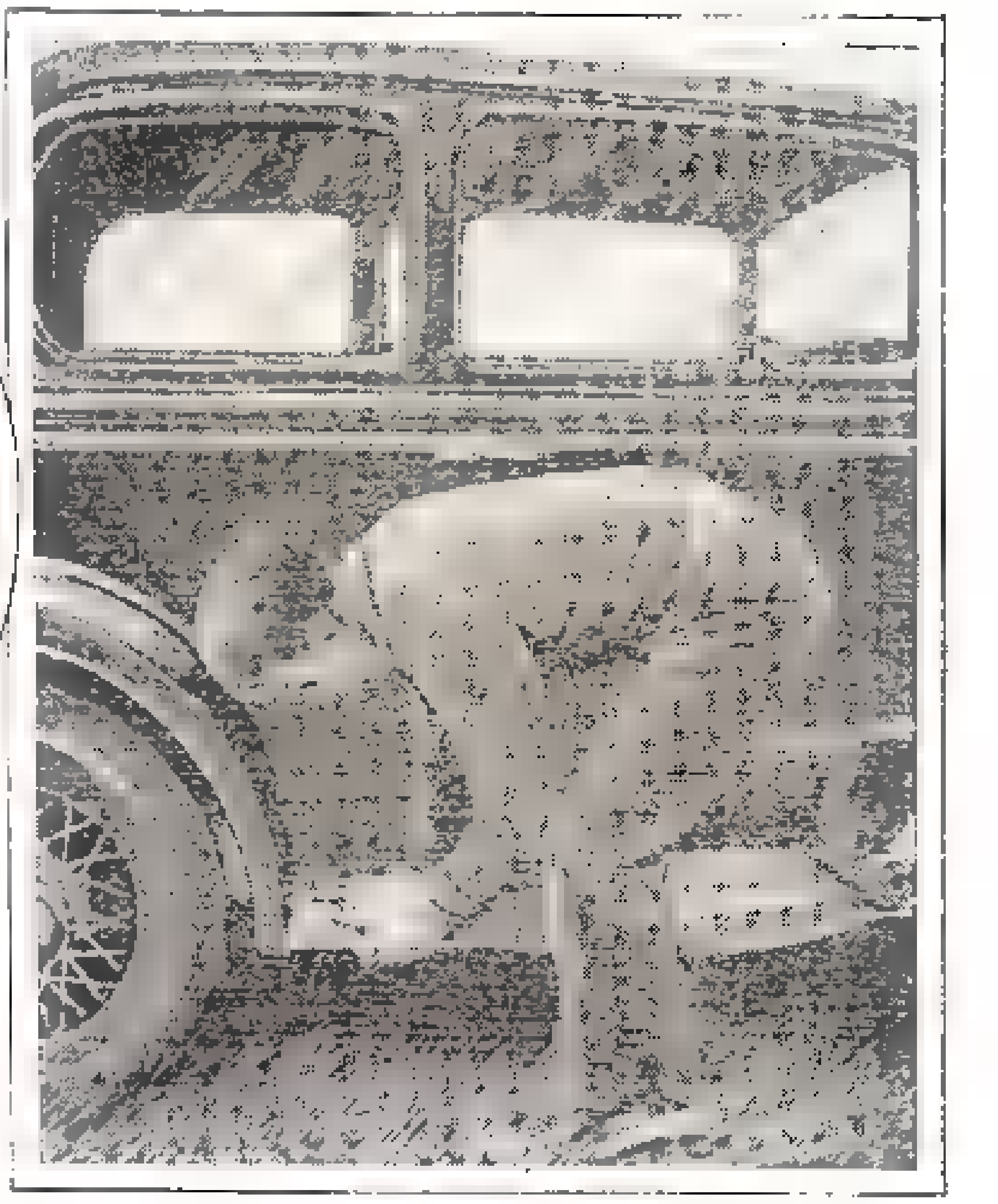
A coat of standard auto wax rubbed into the finish after mud has been washed off will greatly improve appearance.



When pedals become too slippery, clean with gasoline and apply a few coats of ordinary rubber cement.



Spring shackle bolts determine to great extent riding qualities of car. They should be greased, and not too tight.



Clean running board, fasten down new mat with rubber cement, pile on sand to press mat firmly down at all points.

by F. H. MONSON

SPRING is the time to tune up the old bus and get it ready for a summer of pleasure. Winter is so hard on any automobile, that a spring overhauling is a necessity.

There are a number of things that you can do about your car to provide more comfort, safety and freedom from breakdown. Perhaps the first object of attention should be the motor: If the points in the distributor are pitted, remove them and dress their faces on an oil stone until clean. If they cannot be cleaned properly it is wise to replace them with new ones.

Distributor Point Clearance

After installation, space them to the proper clearance, as specified by the manufacturer of your car. This clearance is usually about 18/1000 of an inch, or about the thickness of the wire in an ordinary paper clip.

See that the distributor cap is clean and free of cracks. Inspect the spark-plug wires, and if they are cracked or oil-soaked, replace them; the best plug in the world will not fire properly unless the wires feeding it are in good order. Remove the spark plugs and clean them. Most cars require a spacing of 25/1000 inch of the spark plug points. It is important, for good idle and high speed, that the plugs are set carefully and uniform.

If the generator commutator is dirty, clean with sandpaper, using a light pressure, while the motor is running. Never use emery cloth for this operation. It is best to put the sandpaper on a stick to prevent clipping the fingers. Readjust the charging rate to about 10 to 12 amperes, which should be enough for warm weather driving. Most generators are adjustable in the third brush —the narrowest of the three which is locked by a screw on the back plate of the generator. Moving this brush in the direction of the rotation of the armature increases the charging rate.

After you have drained the anti-freeze from your radiator, flush the system with clean water, tighten the water-pump packing nut just tight enough to prevent leakage, and refill. If it is necessary to flush the radiator with a cleaner it may be done with a sal-soda solution. Never use a flushing compound if your car has an aluminum cylinder head. In this case the radiator must be removed and cleaned separately from the block.

Check Electrical Connections

After you have done all the above work it is wise to tighten all electrical connections on the car—on the dash, instruments coil, lights, distributor, generator, starter and battery. Clean the top of the battery with a solution of household soda and water –then flush off with water. This removes all acid and prevents corrosion.

If you will now grease and lubricate your car carefully, from front to back, you are ready to tackle the job of squeak and rattle hunting. Tighten all body bolts. These bolts hold the body to the frame, and are located, four to six in number, on each side of the frame. The nuts are tightened from the bottom, against the frame.

Almost any car over a year old will develop a cracking or squeaking noise in the

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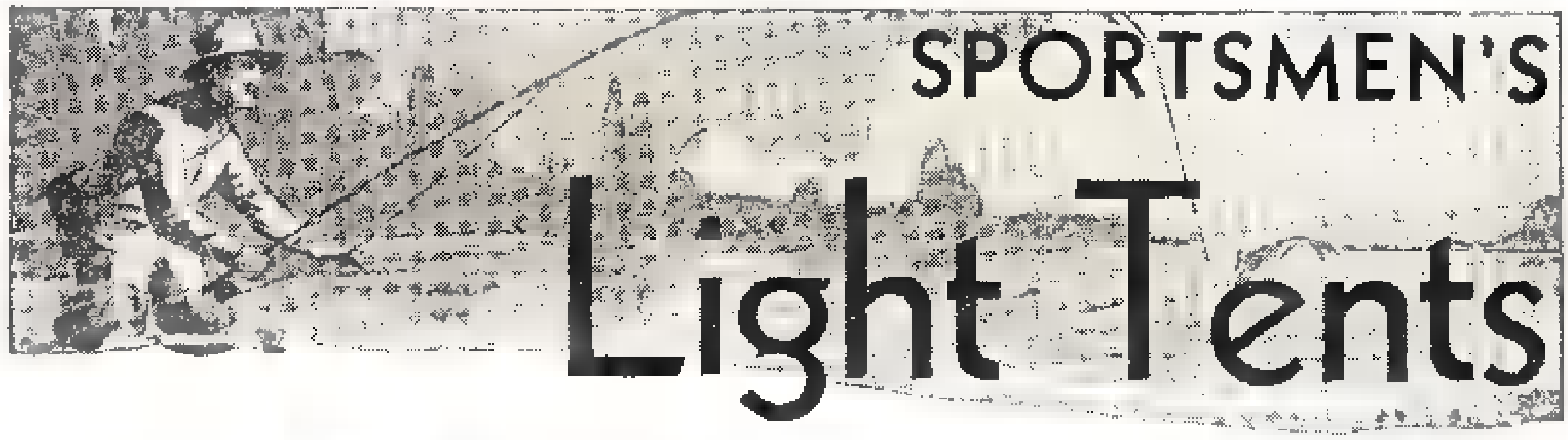
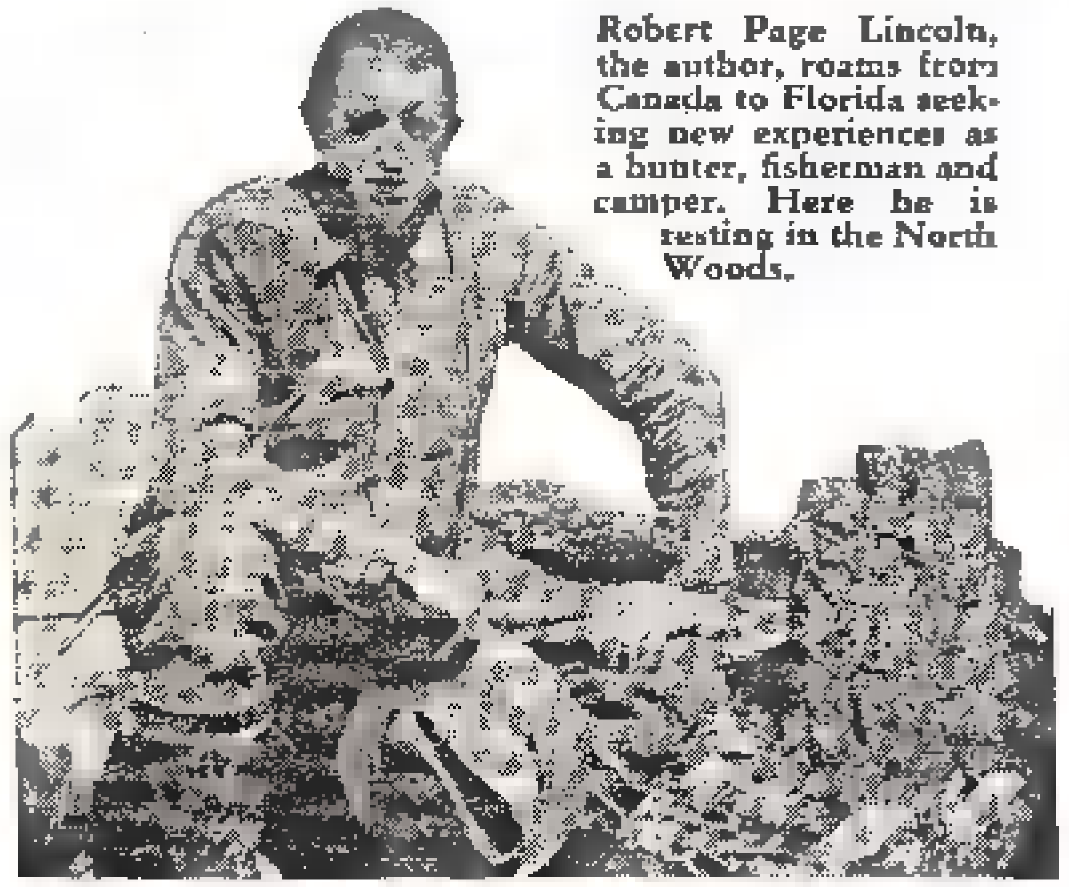


SPORTSMEN'S CAMPFIRE

Light Tents for Campers



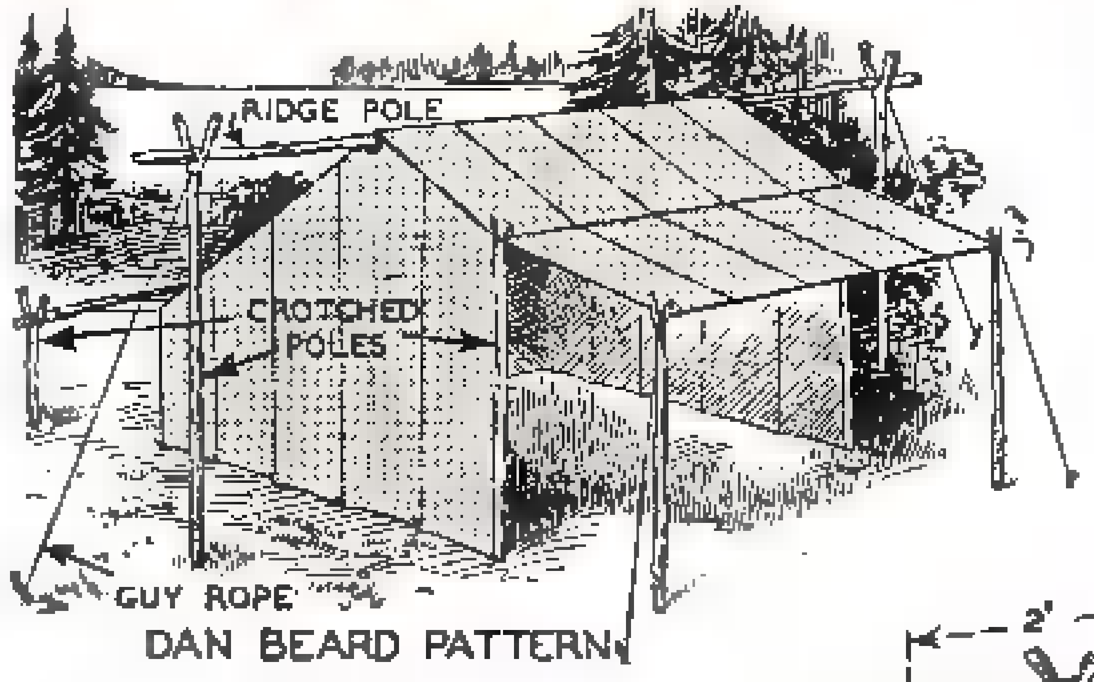
Robert Page Lincoln, the author, roams from Canada to Florida seeking new experiences as a hunter, fisherman and camper. Here he is testing in the North Woods.

by **ROBERT PAGE LINCOLN**
Hunting and Fishing Editor

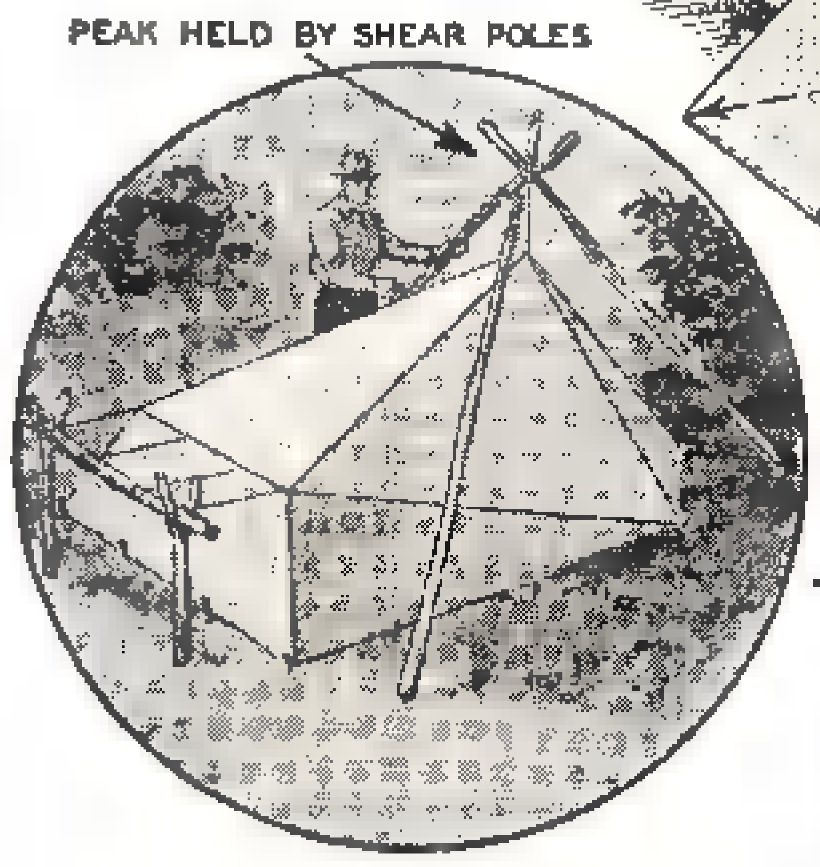
IN MANY ways the little shelter tent, in any one of many designs and patterns, cut and slant, is the most interesting of the canvas roofs open to the purchase of the camping enthusiast. There are those who look upon these tiny tents as suitable for children only, forgetting that the go-light camper, who carries his "all" on his back in a pack-sack, the canoeist, the mountain wanderer and over-night camper who does not wish to be burdened down with a more commodious affair, selects the shelter tent.

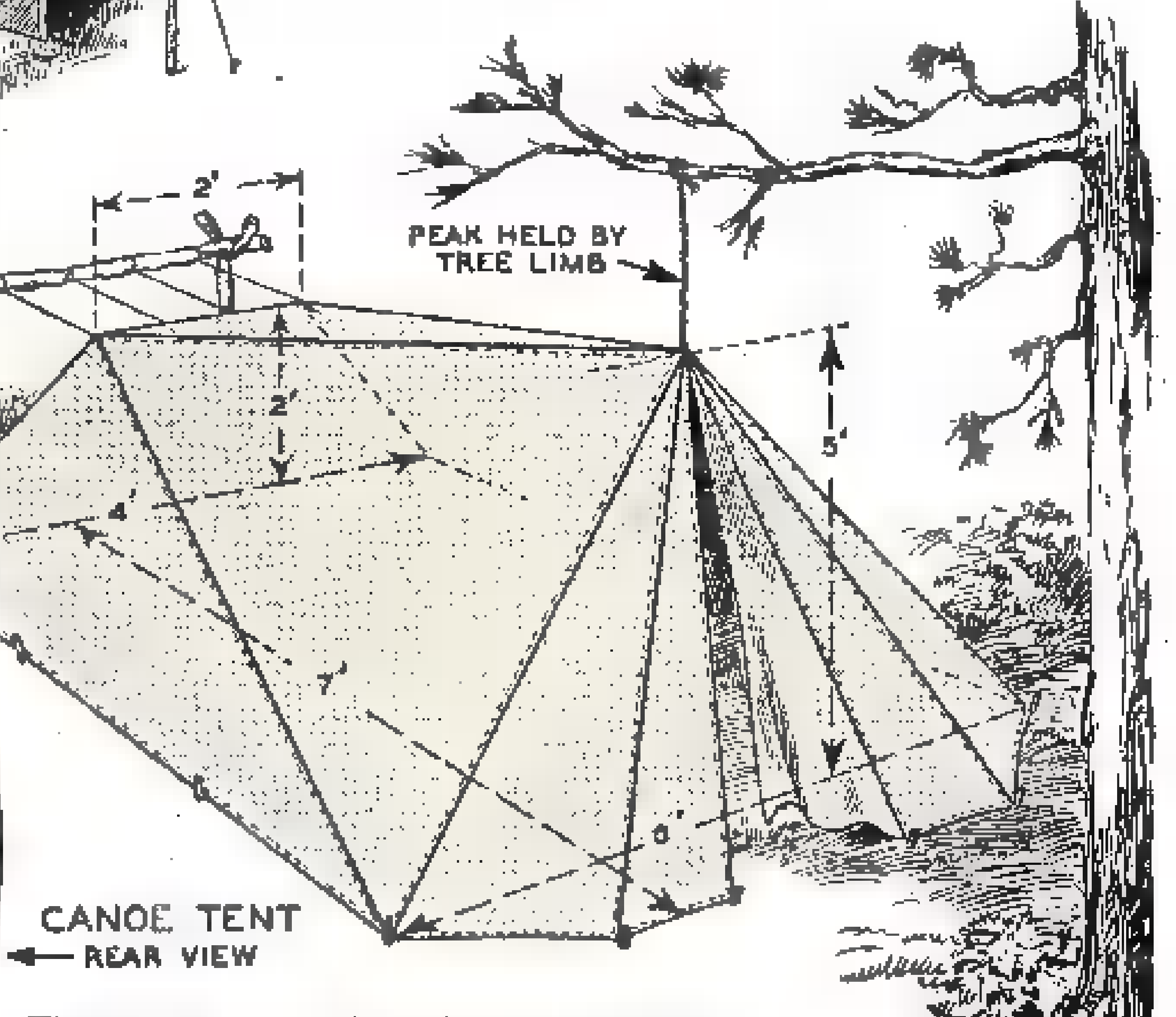
The shelter tent cuts down space to a minimum, and, on the average, is a sleeping tent, no more no less.

Among the shelter tent patterns the so-called army or pup tent is the most common and, on the whole, the least attractive. It is merely a modification of what is known as the wedge or A-tent with a rear extension added to make it a trifle more roomy than it otherwise would be.

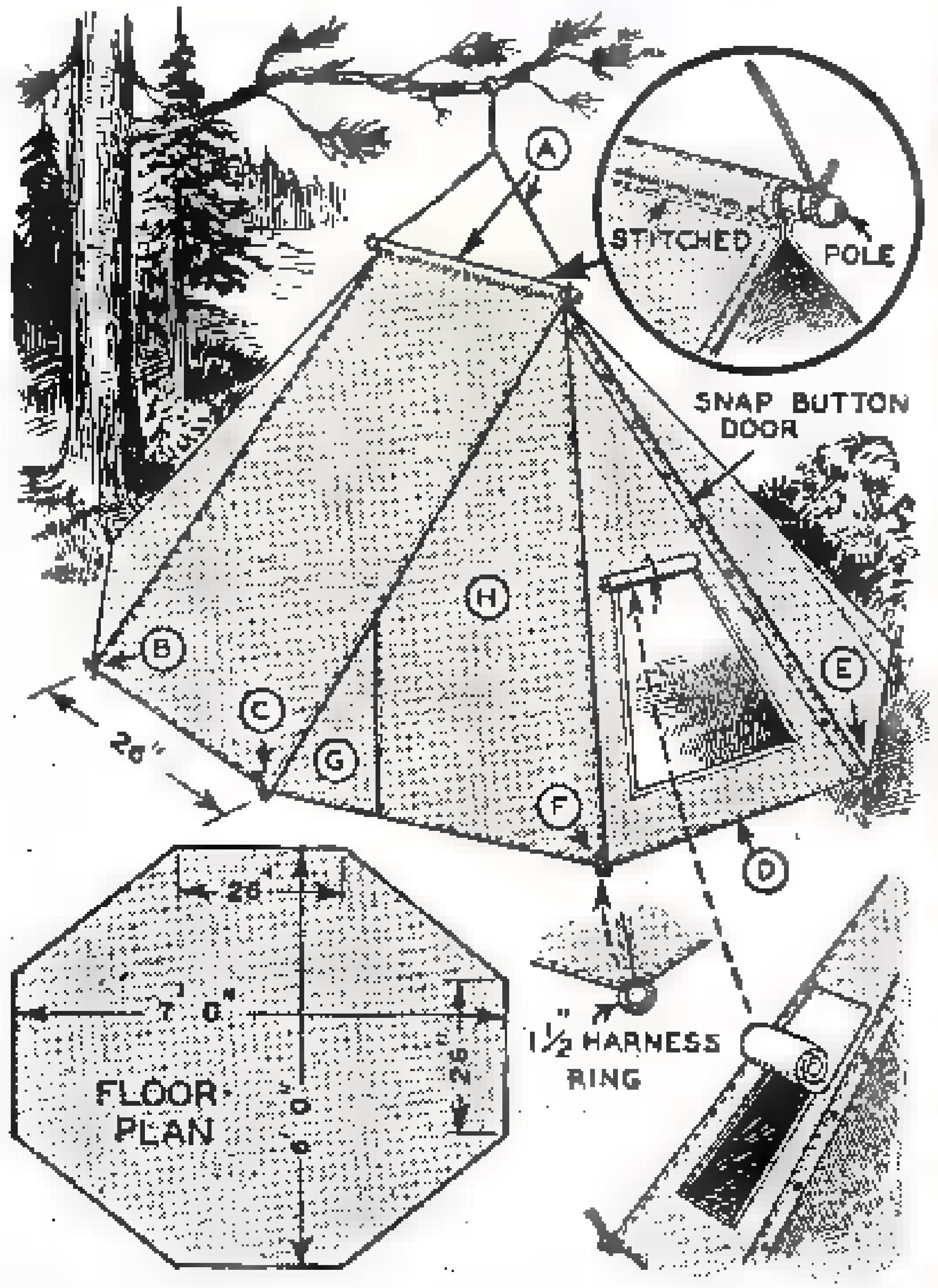


The Dan Beard pattern, above, in many ways is the ideal light tent. Fires can be built in front of it to throw heat into the interior of the tent [illegible] cold days.


PEAK HELD BY SHEAR POLES



The popular Canoe Tent has many advantages. It [illegible] be made any size desired following general outlines shown above. Steps in construction are described in the text. Shear poles are used on open ground and in storms to avoid lightning under trees hitting occupants of tent.

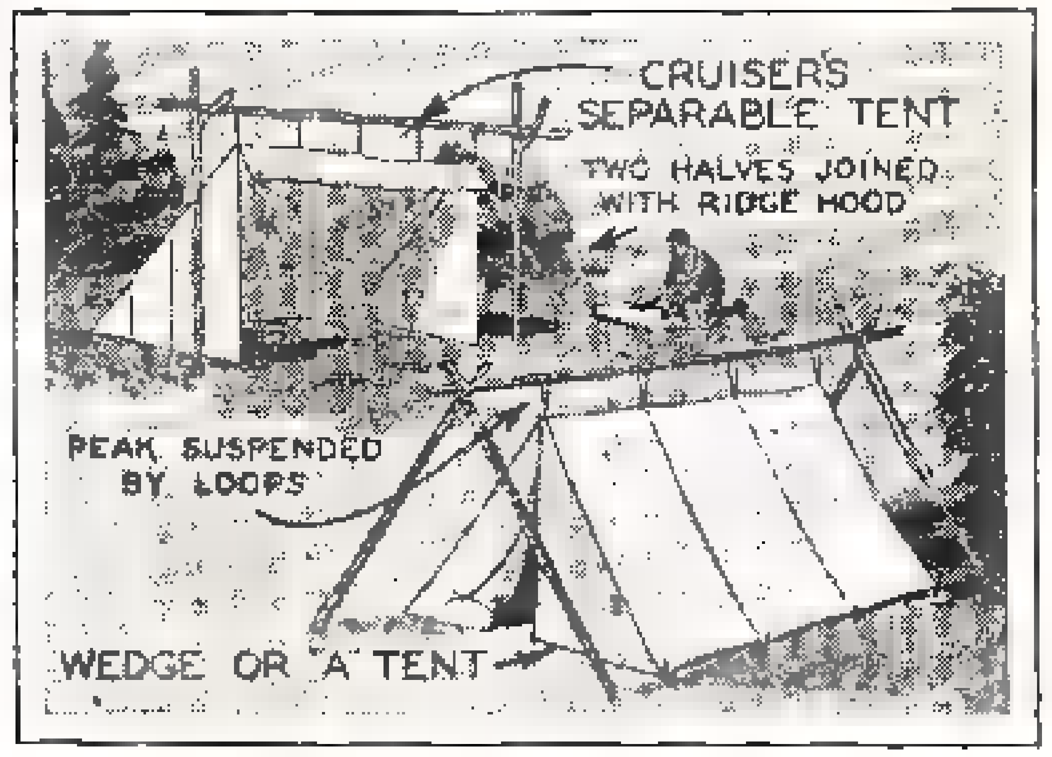


This tent, designed by Robert Page Lincoln, is roomy and rain proof and can be made easily. Openings [illegible] the flap and rear provide ventilation [illegible] sultry summer evenings.

The pup-tent can be made more roomy by simply adding a one foot high wall canvas all around its sides and back, thus raising it up off of the ground. This will provide considerable more space within. This wall canvas need be only waterproofed muslin or lightest canvas. If this wall canvas is added the tent will need to be erected with a ridge pole and guyed out at the sides.

The Cruiser's separable tent, as shown in the illustration, is an example of a very simple and practical shelter tent that anyone can make. It comes in two sections, each section making a half-tent with an open front. A sort of hood of canvas caps the two sections when they are joined at the peak, the same turning any rain that falls. This is sewed to one side of the peak of one section, laps over and is tied with cords to other cords attached to the second section.

The Lincoln model tent in actual use. Note that the peak is held up by shear poles. The tent is five feet high. All light tents can be simply lined out with cords.



The Cruiser's Separable and Wedge Tents are among the simplest of light tent designs described in the text.

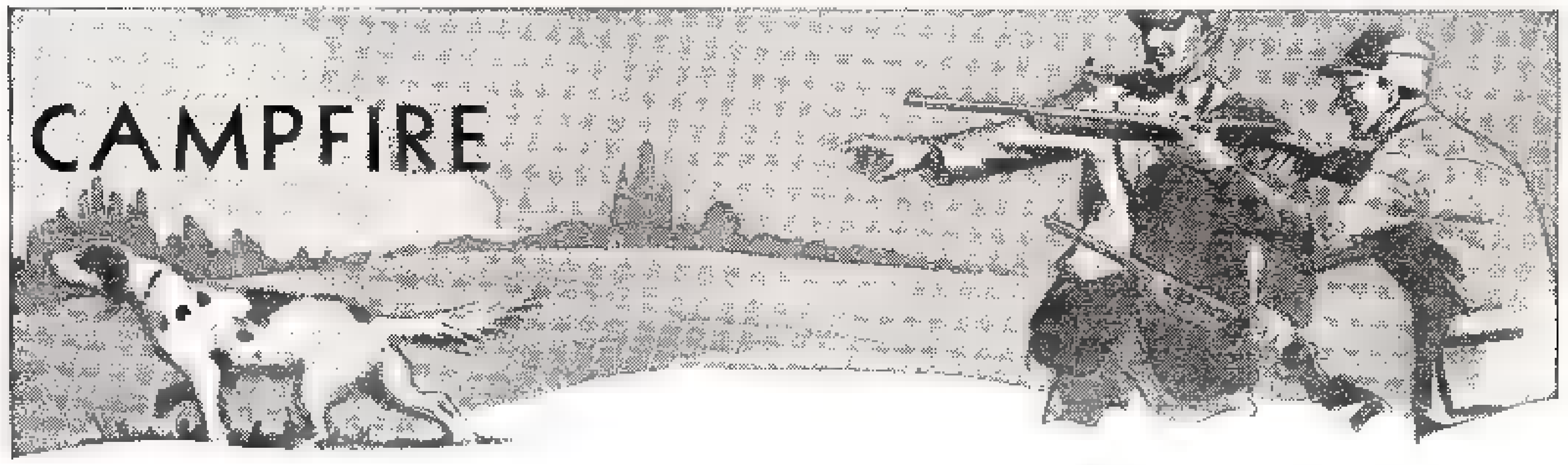
To reinforce the ridge or peak a rope of about the size and variety of a window sash cord is sewed in, to which the ridge rings or canvas loops that connect to the ridge pole are sewed. The second half of this type of tent has its peak canvas buttoned to the ridge of the other half, the peak hood overlapping the buttoned section thus protecting it from the rain.

The wedge or A-tent is, of course, merely a typical ridge tent, sewed together at the peak as most tents are. It is probably the most simple tent of all to make. This tent, too, has the rope sewed into the inside of its ridge to support the same, and give bearing to the canvas loops that are slipped over the ridge pole.

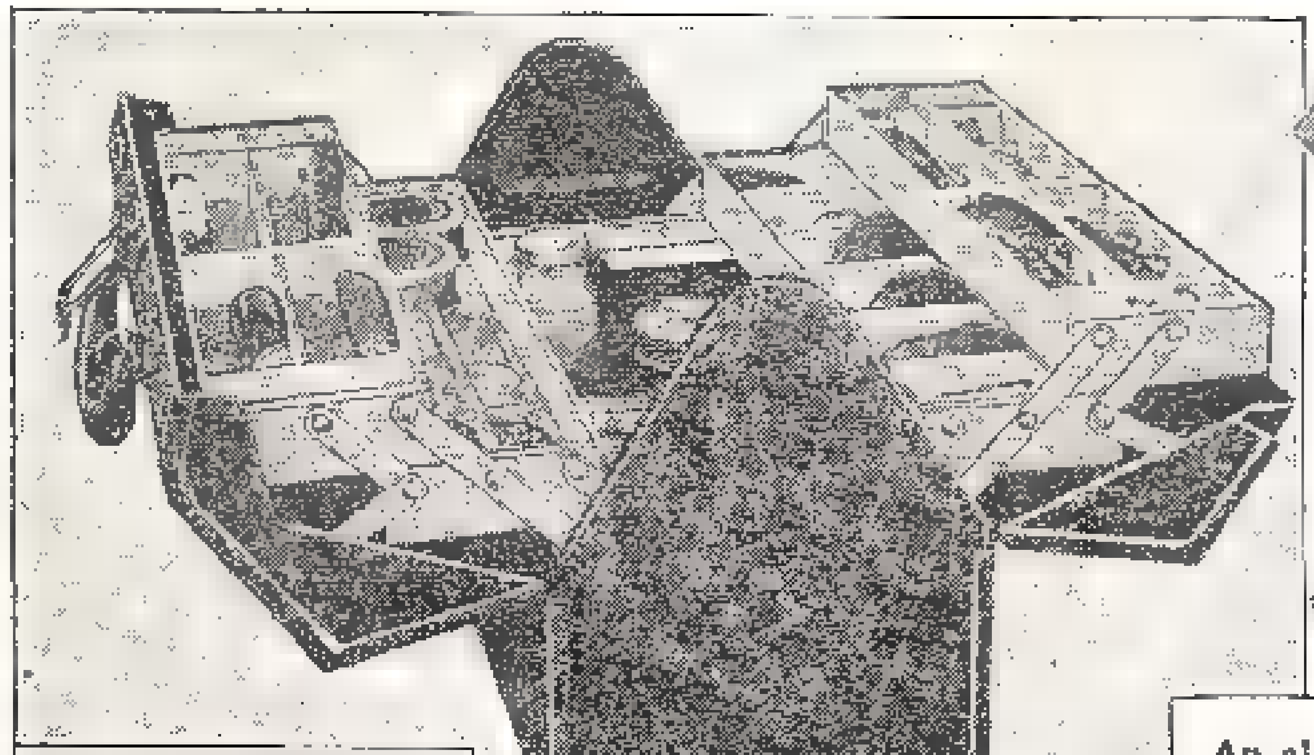
The Dan Beard pattern of tent is another

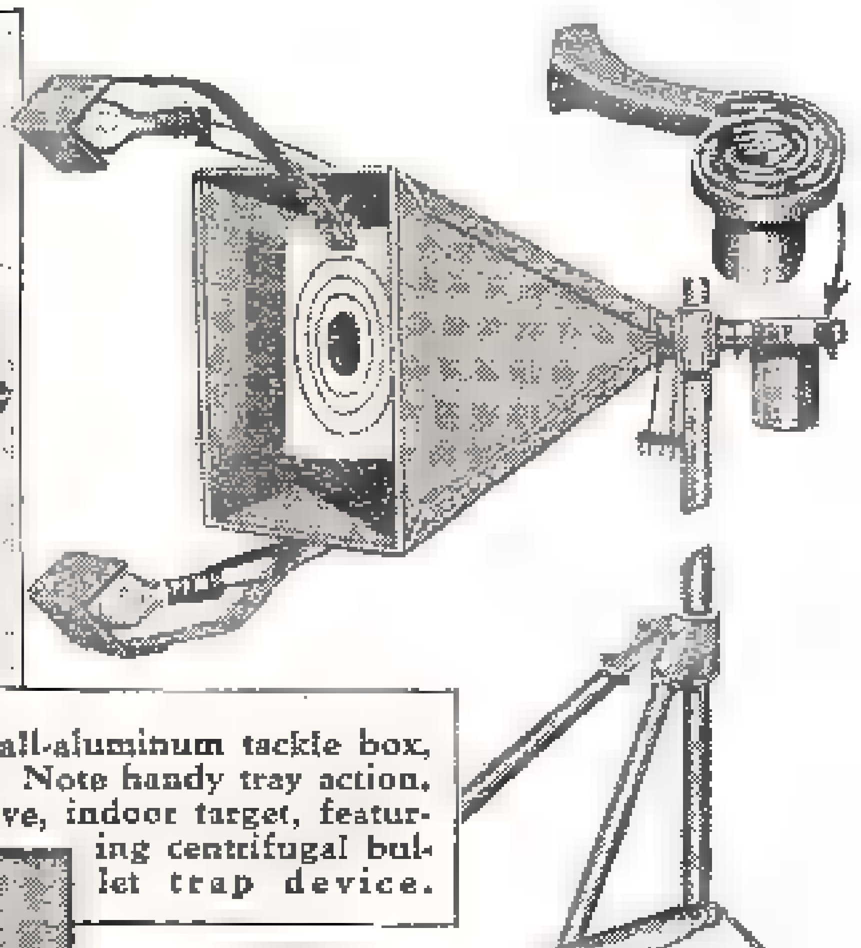
(Continued on page 130)

SPORTSMEN'S CAMPFIRE

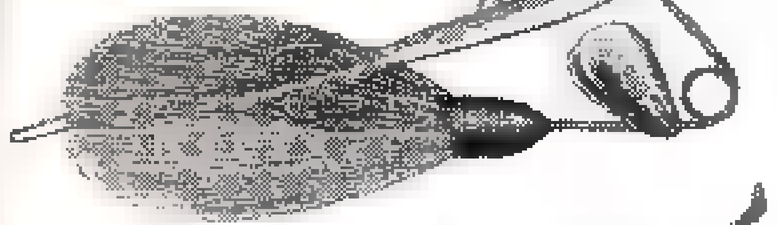


Some New Accessories for Devotees of the Rod and Gun

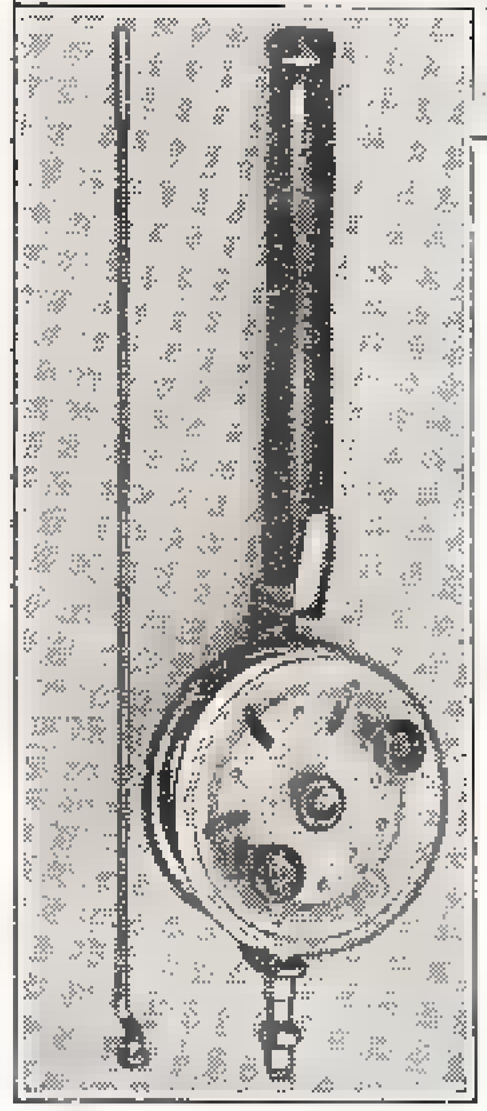




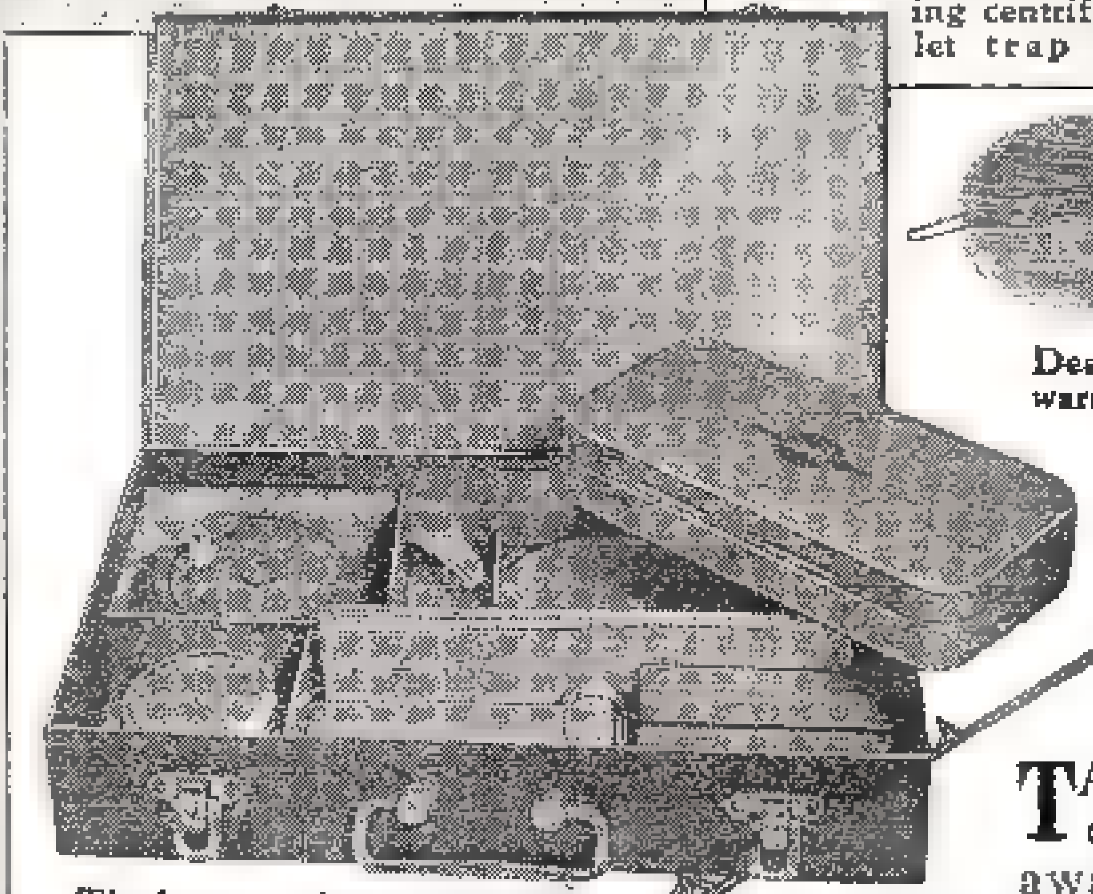
An all-aluminum tackle box, left. Note handy tray action. Above, indoor target, featuring centrifugal bullet trap device.



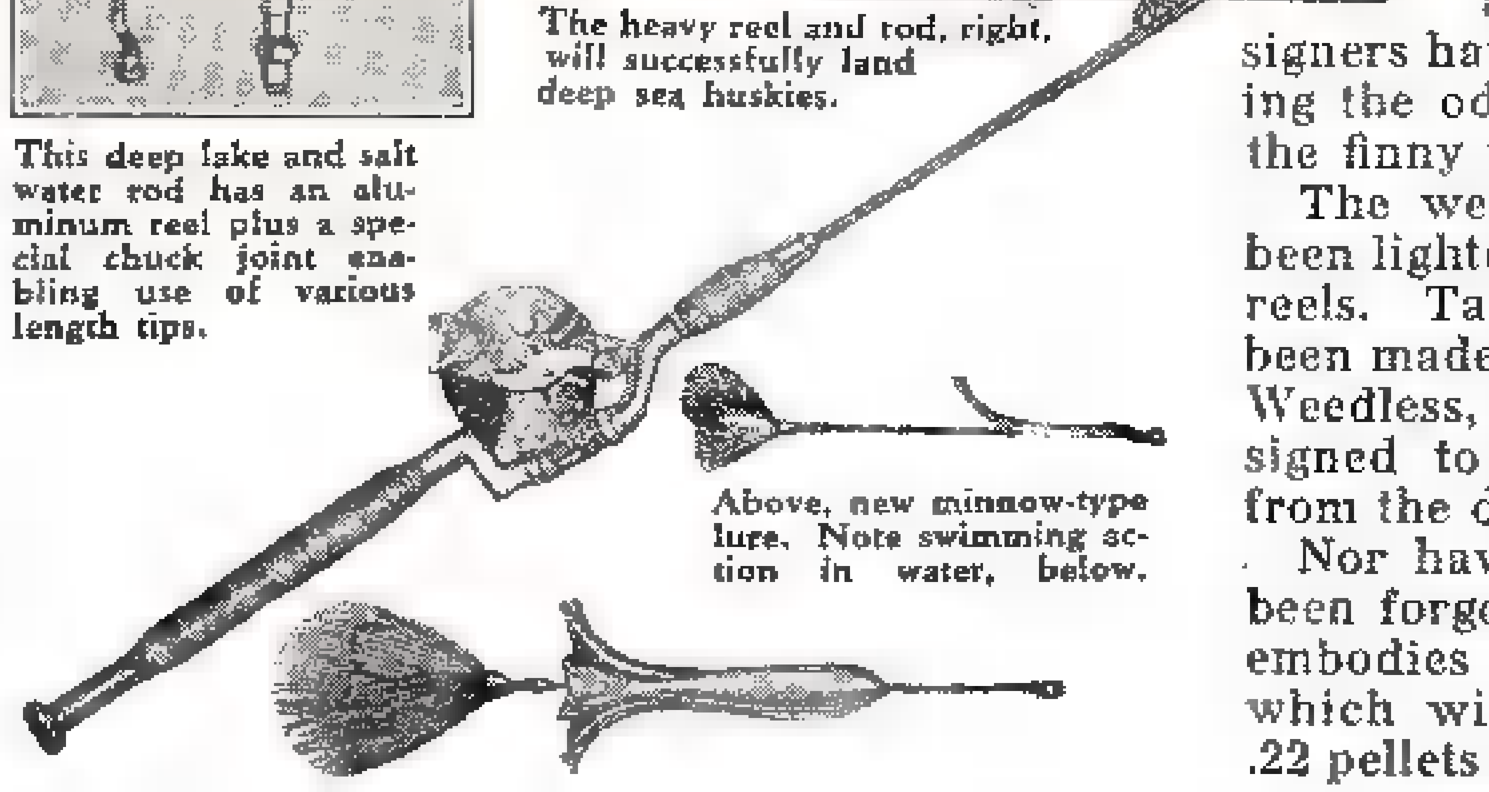
Deer hair spinner, warranted weedless.



This deep lake and salt water rod has an aluminum reel plus a special chuck joint enabling use of various length tips.



Special tackle kit, left, may be used for both fly fishing and bait casting.



The heavy reel and rod, right, will successfully land deep sea huskies.

Above, new minnow-type lure. Note swimming action in water, below.

TAKING up the challenge of the "big ones" that got away last summer, tackle designers have concentrated upon evening the odds in the 1934 battle with the finny tribes.

The weight of deep sea rods has been lightened with sturdy aluminum reels. Tackle boxes have likewise been made lighter and more compact. Weedless, life-like lures have been designed to inveigle the wiliest bass from the depths of his shadowy pool.

Nor have the rifle and pistol fans been forgotten. A new indoor target embodies a centrifugal bullet trap which will stop anything from the .22 pellets to the heavy .45 pistol slugs.

Train Your Hunting Dog for Field Work on Game Now

PATIENCE, kindness, and time are the main essentials in training dogs for hunting game. Most handlers start training pointers, setters, spaniels and retrievers at six months. By the time the puppy is ten months old he is usually ready for the field.

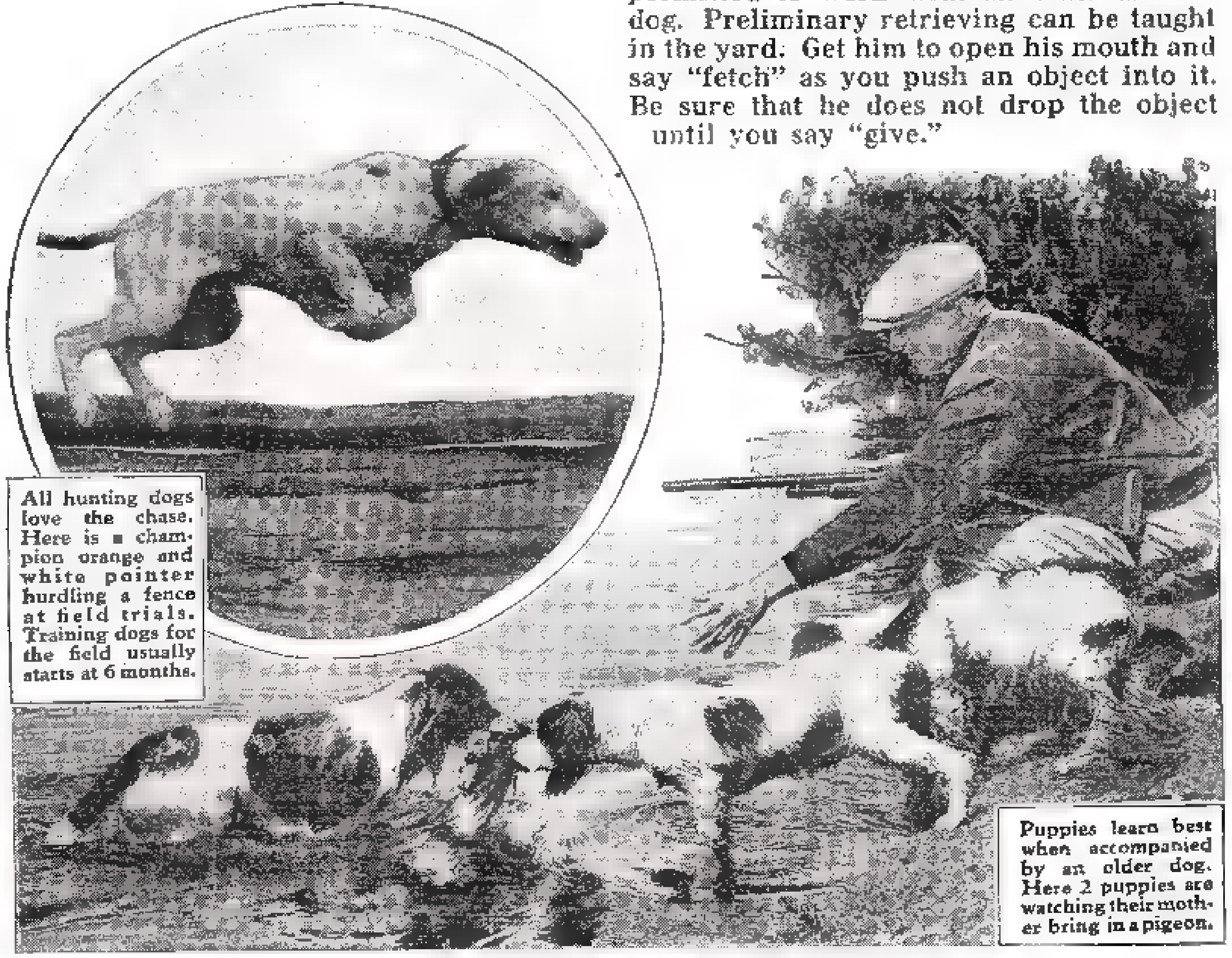
You can not break a dog of gunshyness by firing a gun over his head or directly at him. The easiest way is to take a gun of small caliber and have someone fire it at some distance from the dog while you pat the animal's head to quiet him. Gradually decrease the distance until the dog shows no sign of fright. Then follow the same procedure with a regular hunting gun. Finally let the dog loose.

Retrieving, natural to all hunting dogs, is best begun in the yard with a check cord. The dog must learn to stop on command; drop down where he is on command; and "fetch" when told to do so.

Hold a long cord passing through a ring on a stake in the ground and attached to a choke collar. Hold the dog near the stake, get some distance away and then attract his attention. After he moves a few paces toward you, call "stop" and check him with the cord.

After a few days walk toward him, checking him if he moves. Then walk past him and eventually you will be able to check him without the cord.

A dog will easily pick up field work if permitted to work with an older trained dog. Preliminary retrieving can be taught in the yard. Get him to open his mouth and say "fetch" as you push an object into it. Be sure that he does not drop the object until you say "give."



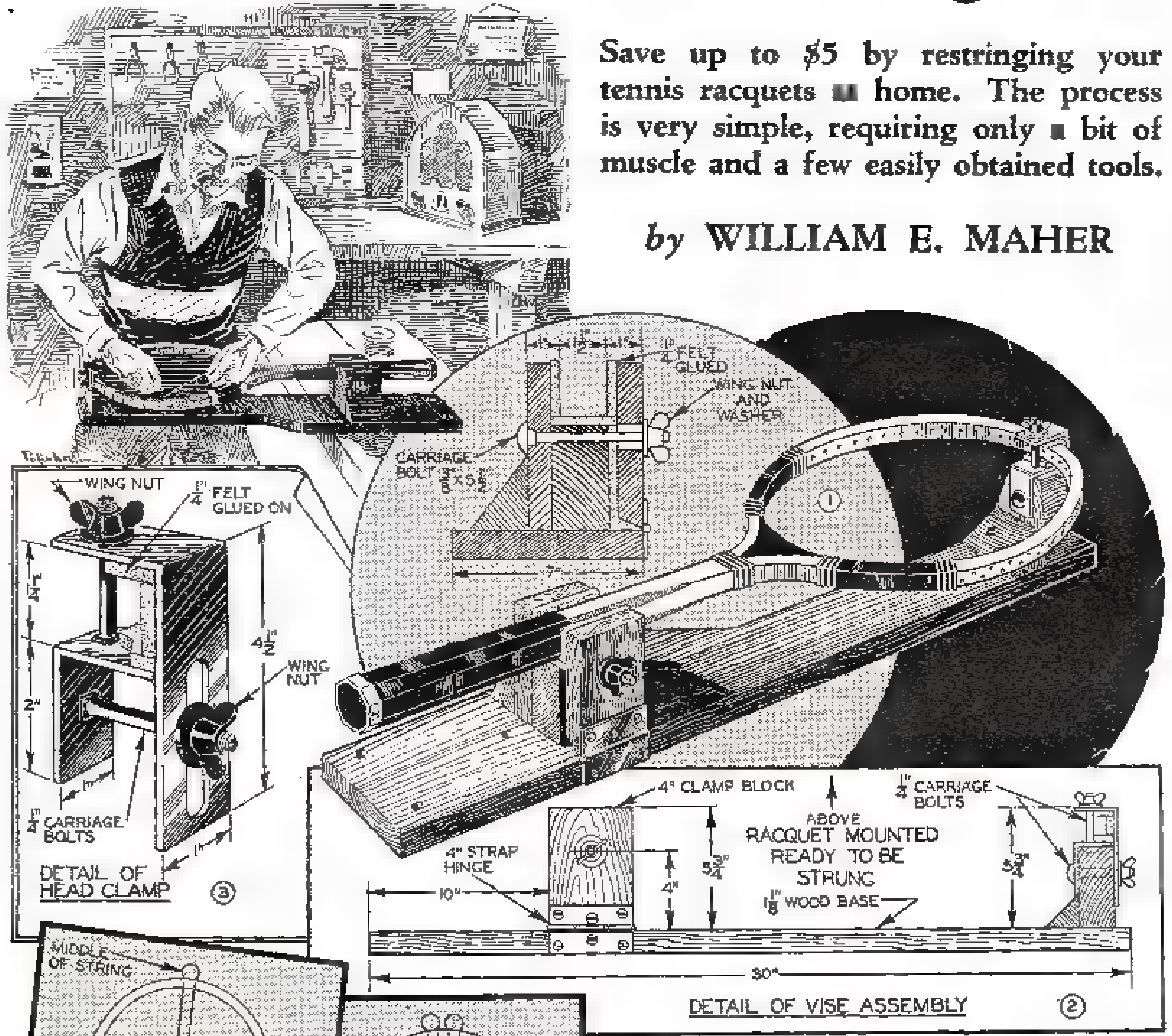
All hunting dogs love the chase. Here is a champion orange and white pointer hurdling a fence at field trials. Training dogs for the field usually starts at 6 months.

Puppies learn best when accompanied by an older dog. Here 2 puppies are watching their mother bring in a pigeon.

How to RESTRING *Your Own* TENNIS RACQUET

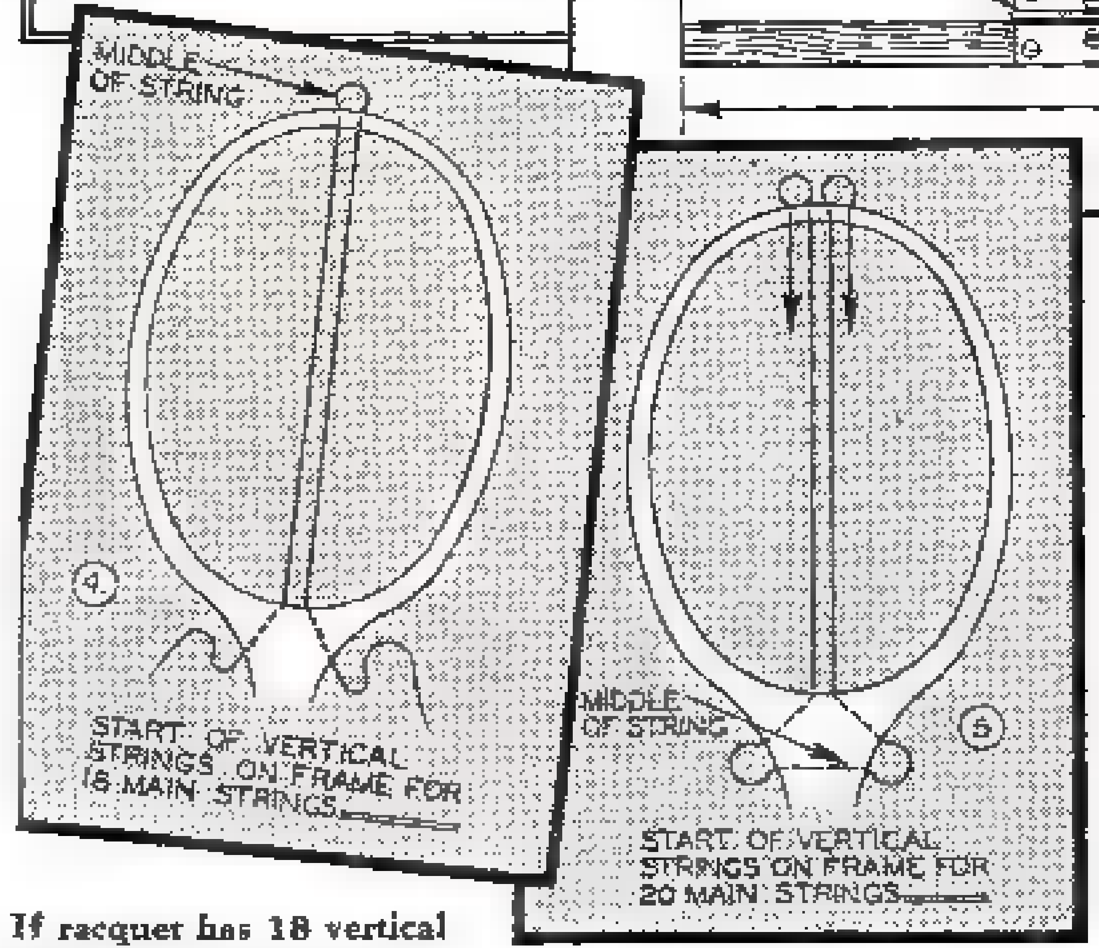
Save up to $5 by restringing your tennis racquets at home. The process is very simple, requiring only a bit of muscle and a few easily obtained tools.

by WILLIAM E. MAHER



1/4" FELT GLUED
WING NUT AND WASHER
CARRIAGE BOLT 3/8 X 5 1/2
①
WING NUT
1/4" FELT GLUED ON
4 1/2"
WING NUT
2"
1/4" CARRIAGE BOLTS
DETAIL OF HEAD CLAMP
③
4" CLAMP BLOCK
ABOVE RACQUET MOUNTED READY TO BE STRUNG
1/4" CARRIAGE BOLTS
4" STRAP HINGE
10"
1 1/8" WOOD BASE
30"
DETAIL OF VISE ASSEMBLY
②

Felt lined vise to hold racquet handle may be made as shown above from blocks of wood, a thumb screw, and a hinge. Head clamp is made from pieces of strap iron.



MIDDLE OF STRING
④
START OF VERTICAL STRINGS ON FRAME FOR 18 MAIN STRINGS
MIDDLE OF STRING
⑤
START OF VERTICAL STRINGS ON FRAME FOR 20 MAIN STRINGS

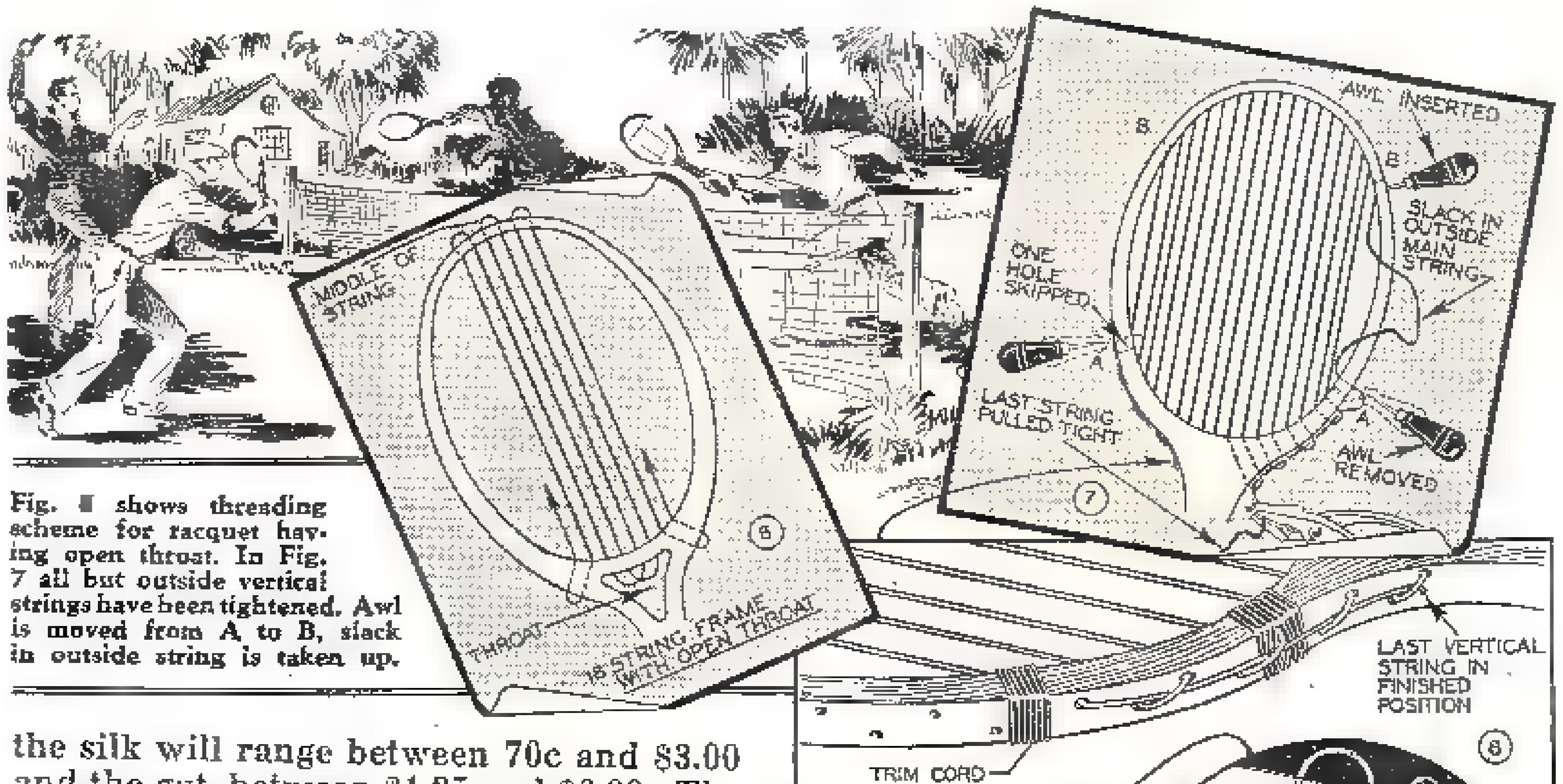
If racquet has 18 vertical strings, start them as in Fig. 4; if 16 or 20, begin at throat as in Fig. 5. Thread all vertical strings in loosely before beginning to tighten.

NOW that short working hours are here for everybody, tennis is becoming more popular than ever with thousands and thousands of sports enthusiasts.

Amateur as well as professional tennis players can easily restring their own racquets by following these simple instructions. The process is not complicated, and is extremely fascinating. The whole job will take only about 1½ hours, and will save the restringer up to five dollars.

No experience or expensive equipment is needed. The tools required are: a vise, four ice-picks or restringers' awls, a pair of pliers (if possible, a pair with parallel acting jaws) and a round wooden dowel about an inch and a half in diameter and eight inches long, wrapped with friction tape.

Of course, the most important requisite is the gut used in restringing the racquet. It is made either of silk or sheeps gut. Of the two, the former is the cheaper, the easier to work with, and the most wearable. However, it does not possess quite the liveliness of sheeps gut. The price of the silk will range between 70c and $3.00 and the gut, between $1.25 and $6.00. The cheapest silk string is much to be preferred to the cheaper gut strings.



MIDDLE OF STRING
THROAT
18 STRING FRAME WITH OPEN THROAT
⑥
B
B
AWL INSERTED
ONE HOLE SKIPPED
SLACK IN OUTSIDE MAIN STRING
A
LAST STRING PULLED TIGHT
A
AWL REMOVED
⑦
LAST VERTICAL STRING IN FINISHED POSITION
TRIM CORD
⑧

Fig. 6 shows threading scheme for racquet having open throat. In Fig. 7 all but outside vertical strings have been tightened. Awl is moved from A to B, slack in outside string is taken up.

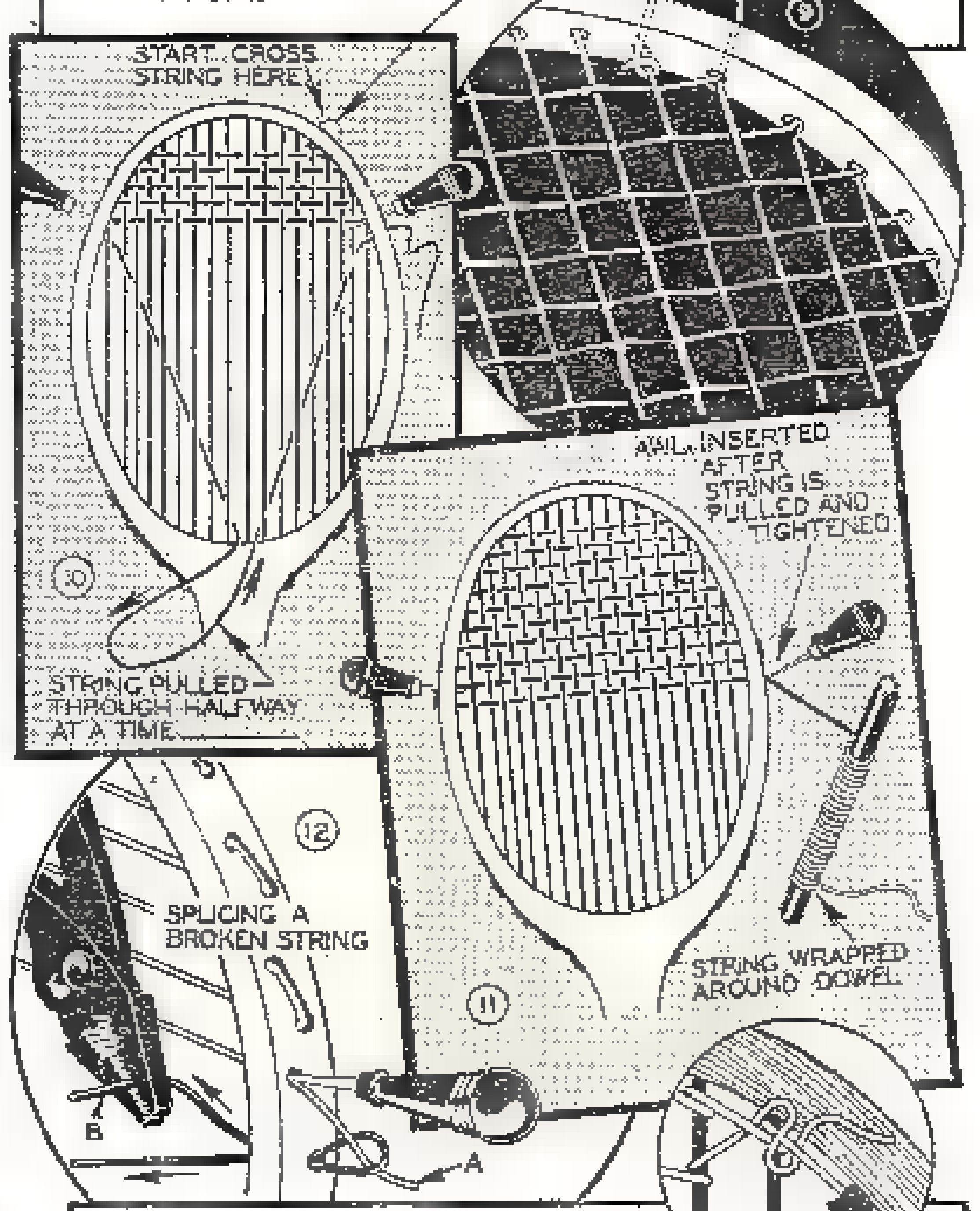
A list of firms selling tennis gut in small quantities will be sent free to those enclosing a stamped envelope. Address MODERN MECHANIX AND INVENTIONS, 529 So. 7th St., Minneapolis, Minn.

Thirty-six feet of string, preferably in the 15-gauge thickness, are required to string a racquet. Nineteen feet of this is used for the vertical strings, and the remainder for the cross or horizontal strings.

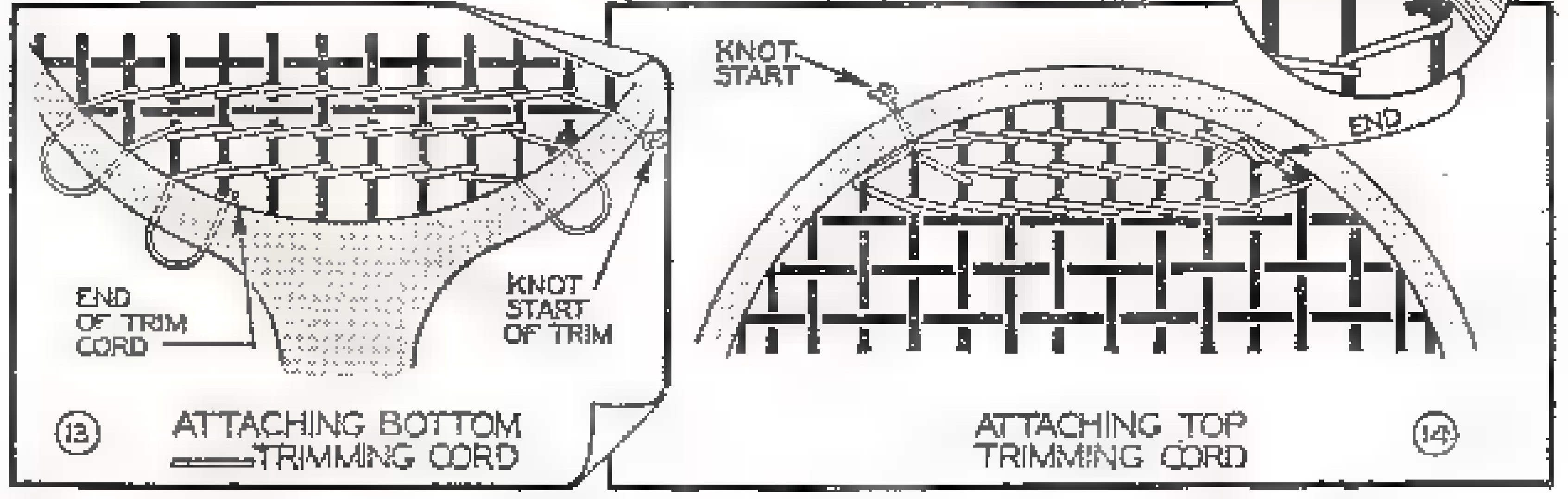
Before restringing, any frame holes that are rough or jagged should be reamed out with an ice-pick.

The equipment needed to hold the racquet must next be prepared. The vise (any small vise) should be fastened to a heavy plank about 12 inches wide and a little longer than the racquet. The plank must be fastened to a firm support. If the reader intends to string a number of racquets he should make a head-clamp. This will be mounted at the end of the plank to hold the head of the racquet in place. When the wing nuts are tightened, the racquet will be held firmly, and any possible warping of the frame will be prevented. A wood clamp is easier to make, but because of its necessarily larg-

(Cont. on p. 122)



START CROSS STRING HERE
⑨
⑩
STRING PULLED THROUGH HALFWAY AT A TIME
AWL INSERTED AFTER STRING IS PULLED AND TIGHTENED
STRING WRAPPED AROUND DOWEL
⑪
SPLICING A BROKEN STRING
⑫
B
A



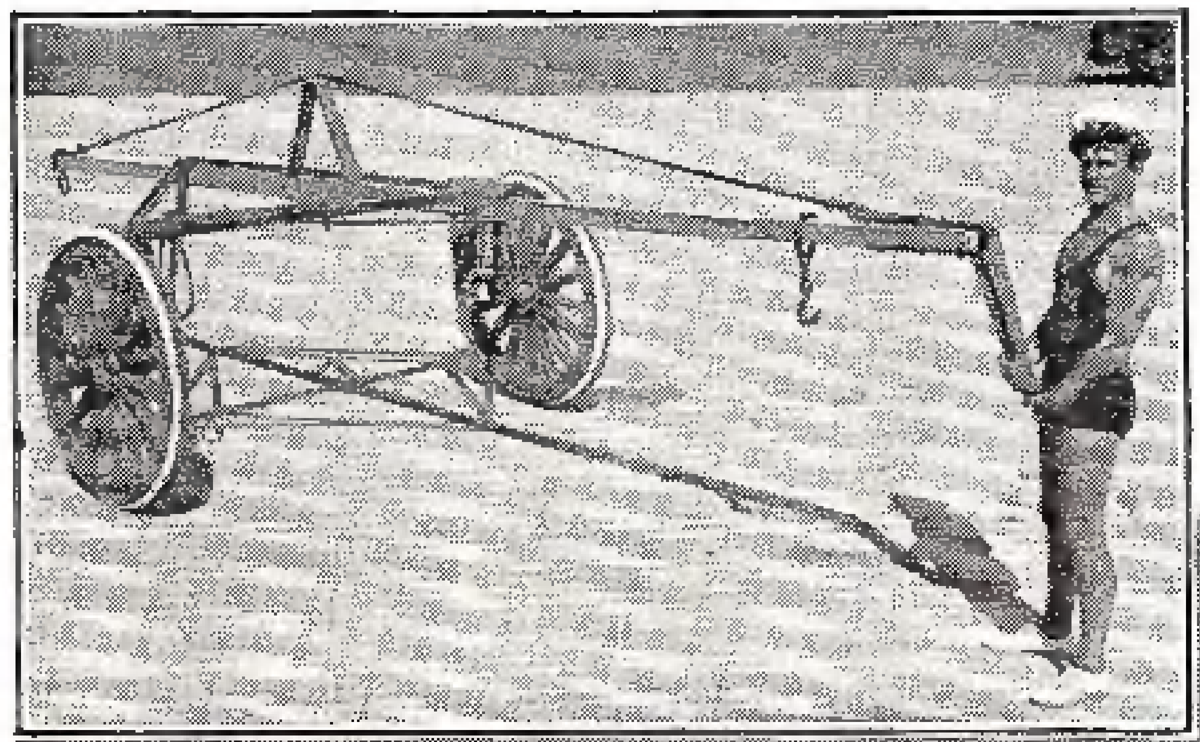
END OF TRIM CORD
KNOT START OF TRIM
⑬
ATTACHING BOTTOM TRIMMING CORD
KNOT START
END
ATTACHING TOP TRIMMING CORD
⑭

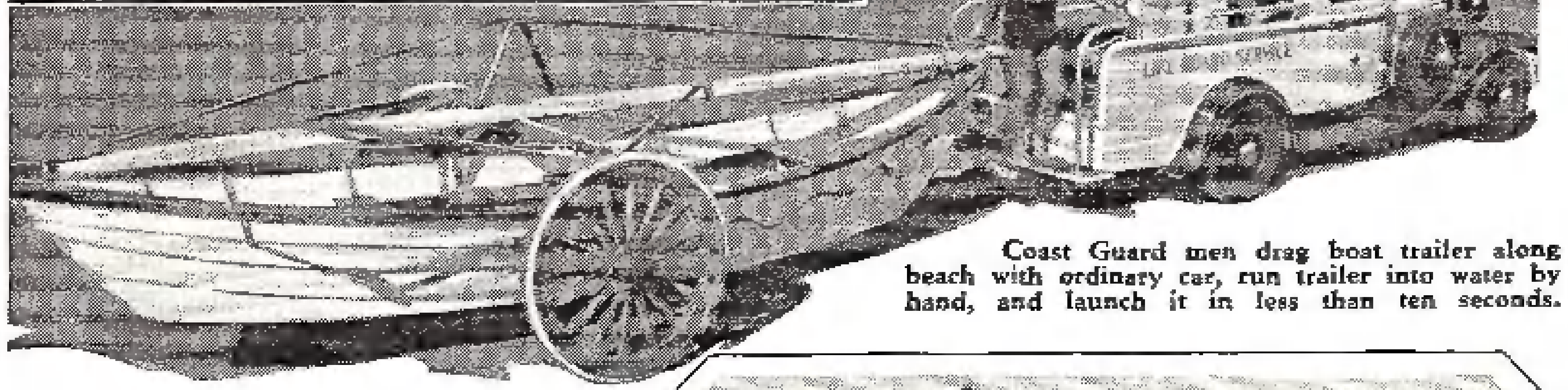
Figs. 9 and 10 show beginning of cross strings. Tie knot at fourth vertical string from two center strings. For rapid weaving of cross strings, pull through half way at time. String is wrapped around wood dowel for firm grip when tightening. Broken strings are easily repaired as shown in Fig. 12. Trimming cord may be used at top and bottom to improve appearance.

Build a Suspension Trailer for Your Boat

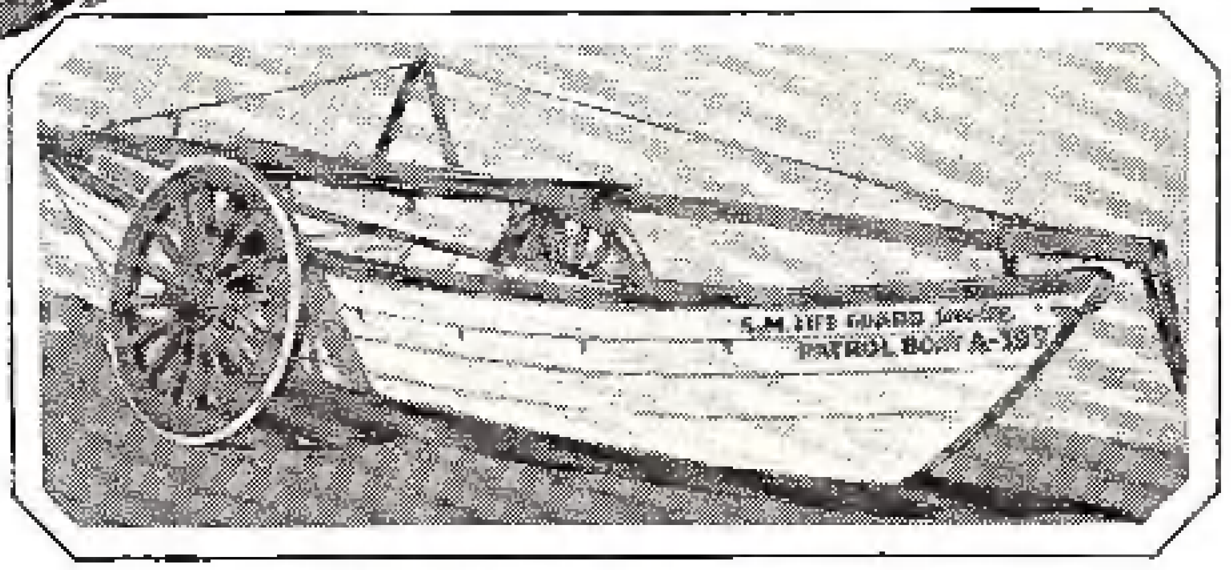
by
PAUL W. GARTNER

Boats weighing up to 600 pounds can be launched or taken out of water in 10 seconds with this easily built suspension trailer. Tremendous leverage of beam allows a man to raise a heavy boat into position.

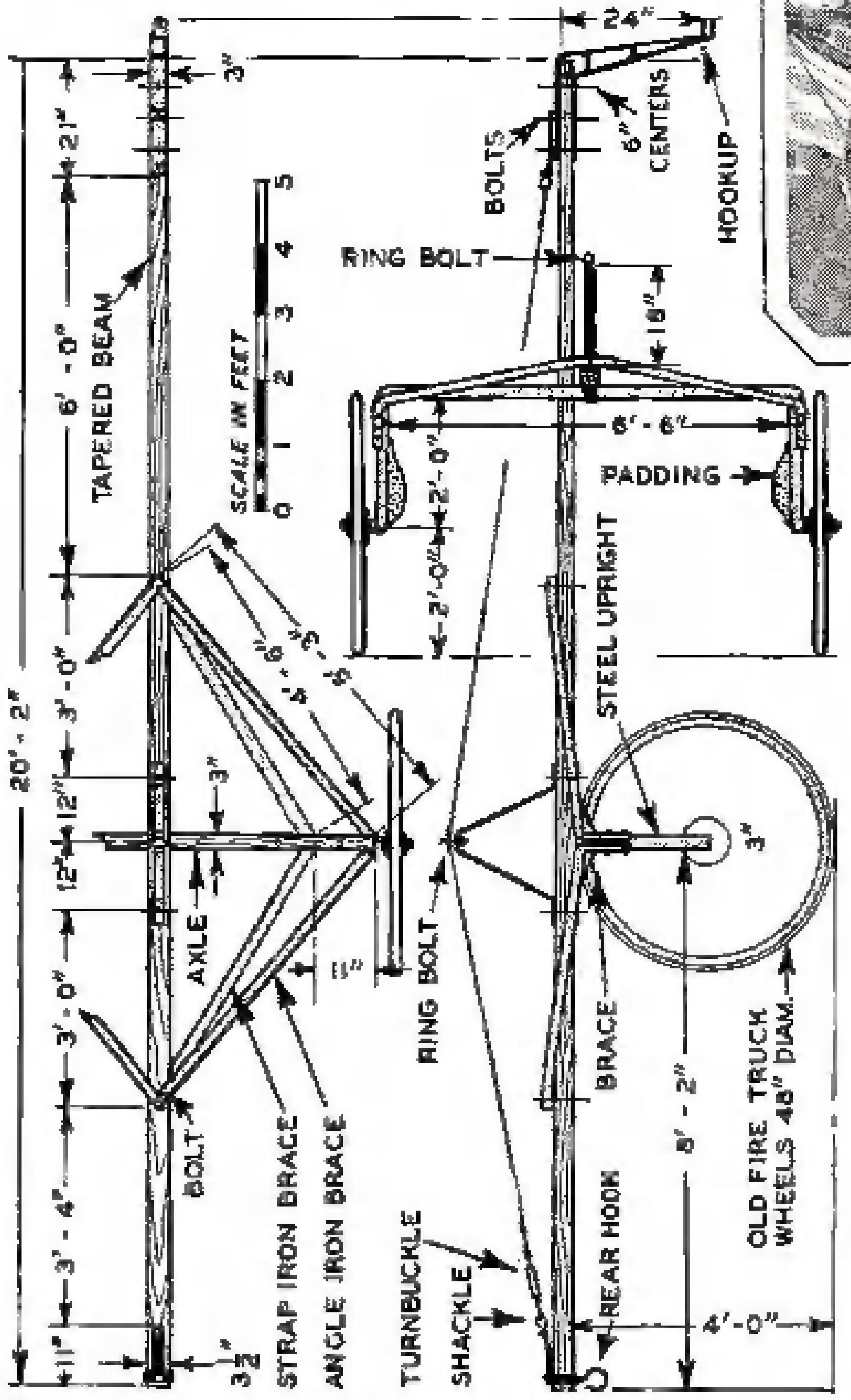




Coast Guard men drag boat trailer along beach with ordinary car, run trailer into water by hand, and launch it in less than ten seconds.



A 20-ft. Coast Guard boat suspended from the trailer. Steel cable carries most of 600-lb. load, permitting small beam.


3"
2'
6' - 0"
TAPERED BEAM
20' - 2"
3' - 0"
12"
12"
3' - 0"
3' - 4"
11"
3½"
3"
AXLE
BOLT
STRAP IRON BRACE
ANGLE IRON BRACE
6' - 3"
4' - 6"
11"
SCALE IN FEET
0
1
2
3
4
5
24"
BOLTS
6" CENTERS
HOOKUP
RING BOLT
18"
6' - 6"
2' - 0"
2' - 0"
PADDING
STEEL UPRIGHT
RING BOLT
BRACE
3"
8' - 2"
OLD FIRE TRUCK WHEELS 48" DIAM.
REAR HOOK
TURNBUCKLE
SHACKLE
4' - 0"

Upper left: Completed suspension boat trailer is very light, and easily pushed along beach. Hookup is held by man.

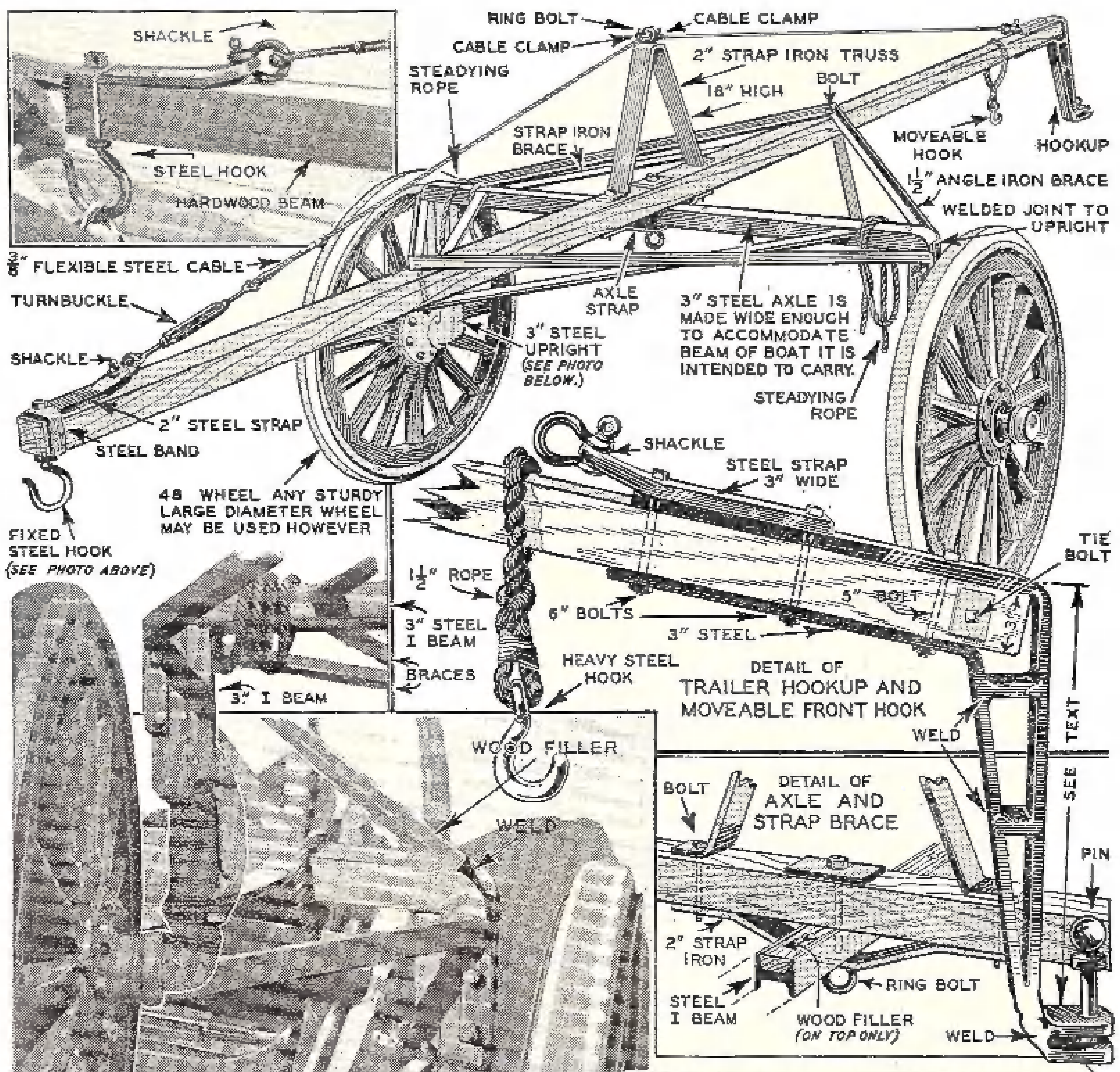
A CALL comes in to life guard headquarters that a small boat is in distress off some lonely spot on the sea beach. Lives are in danger, and every second counts. A seaworthy patrol boat must be picked up on a carrier on a moment's notice, towed by automobile to a point on the beach near the scene of the accident, and hurriedly launched in the surf.

George Watkins, chief of the Santa Monica, California, Life Guard Service, solved this problem by designing the suspension boat trailer. With it a 20-foot dory or skiff weighing more than 600 pounds can be lifted from the ground or shallow water into carrying position in less than 10 seconds by ONE man! The launching of a boat requires even less time.

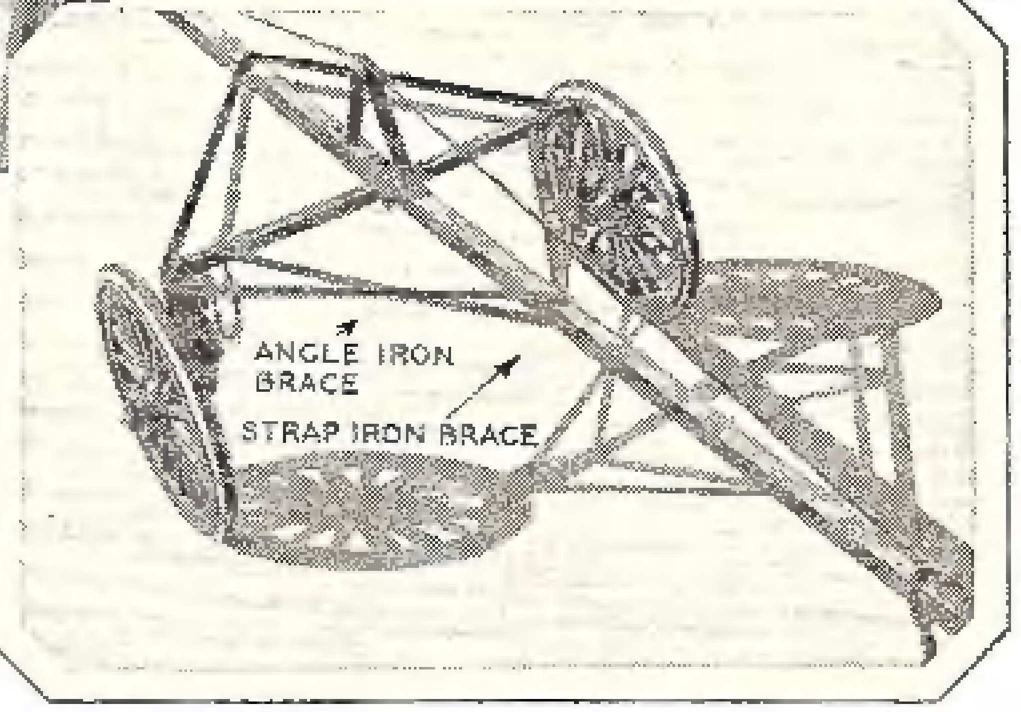
The suspension boat trailer is, primarily, a long, reinforced wood beam, fixed upon a steel axle which has been raised sufficiently high above the wheel hubs to clear the ends and freeboard of the craft to be carried. The rig is simply rolled above the boat, and a fixed hook at the rear extremity of the beam is joined to a steel ring or loop of heavy line attached to the stern of the craft. The leverage of the beam makes it practical for a man of average weight to raise the stern of the boat. Then a movable forward hook is readily fastened to a ring in the bow, and the lift has been accomplished in a very few seconds. Lines dropped from the axle are tied to the gunnels to snub side motion. The weight is so balanced that a single man can raise the forward end when hooking the trailer to an automobile.

Since this carrier was designed to accom-

(Continued on page 124)


SHACKLE
STEEL HOOK
HARDWOOD BEAM
RING BOLT
CABLE CLAMP
CABLE CLAMP
STEADYING ROPE
2" STRAP IRON TRUSS
18" HIGH
BOLT
STRAP IRON BRACE
MOVEABLE HOOK
HOOKUP
1½" ANGLE IRON BRACE
WELDED JOINT TO UPRIGHT
⅜" FLEXIBLE STEEL CABLE
TURNBUCKLE
AXLE STRAP
3" STEEL UPRIGHT (SEE PHOTO BELOW.)
3" STEEL AXLE IS MADE WIDE ENOUGH TO ACCOMMODATE BEAM OF BOAT IT IS INTENDED TO CARRY.
SHACKLE
STEADYING ROPE
2" STEEL STRAP
STEEL BAND
48 WHEEL ANY STURDY LARGE DIAMETER WHEEL MAY BE USED HOWEVER
FIXED STEEL HOOK (SEE PHOTO ABOVE)
SHACKLE
STEEL STRAP 3" WIDE
TIE BOLT
1½" ROPE
3" STEEL I BEAM
BRACES
3" I BEAM
6" BOLTS
5" BOLT
3" STEEL
3"
HEAVY STEEL HOOK
DETAIL OF TRAILER HOOKUP AND MOVEABLE FRONT HOOK
WELD
SEE TEXT
WOOD FILLER
WELD
BOLT
DETAIL OF AXLE AND STRAP BRACE
PIN
2" STRAP IRON
RING BOLT
STEEL I BEAM
WOOD FILLER (ON TOP ONLY)
WELD
PADDING

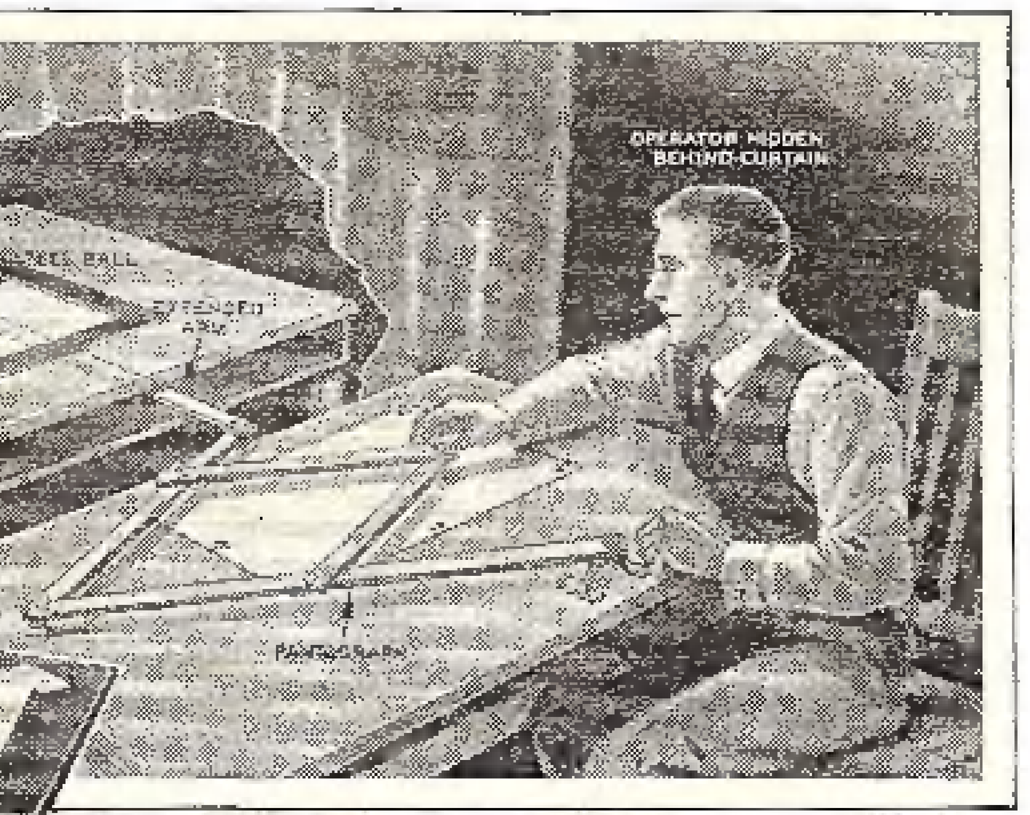
Close-up view showing steel framework of trailer. Framework is padded to prevent boat from being scratched. Fire engine wheels are used here, but large auto wheels will do.

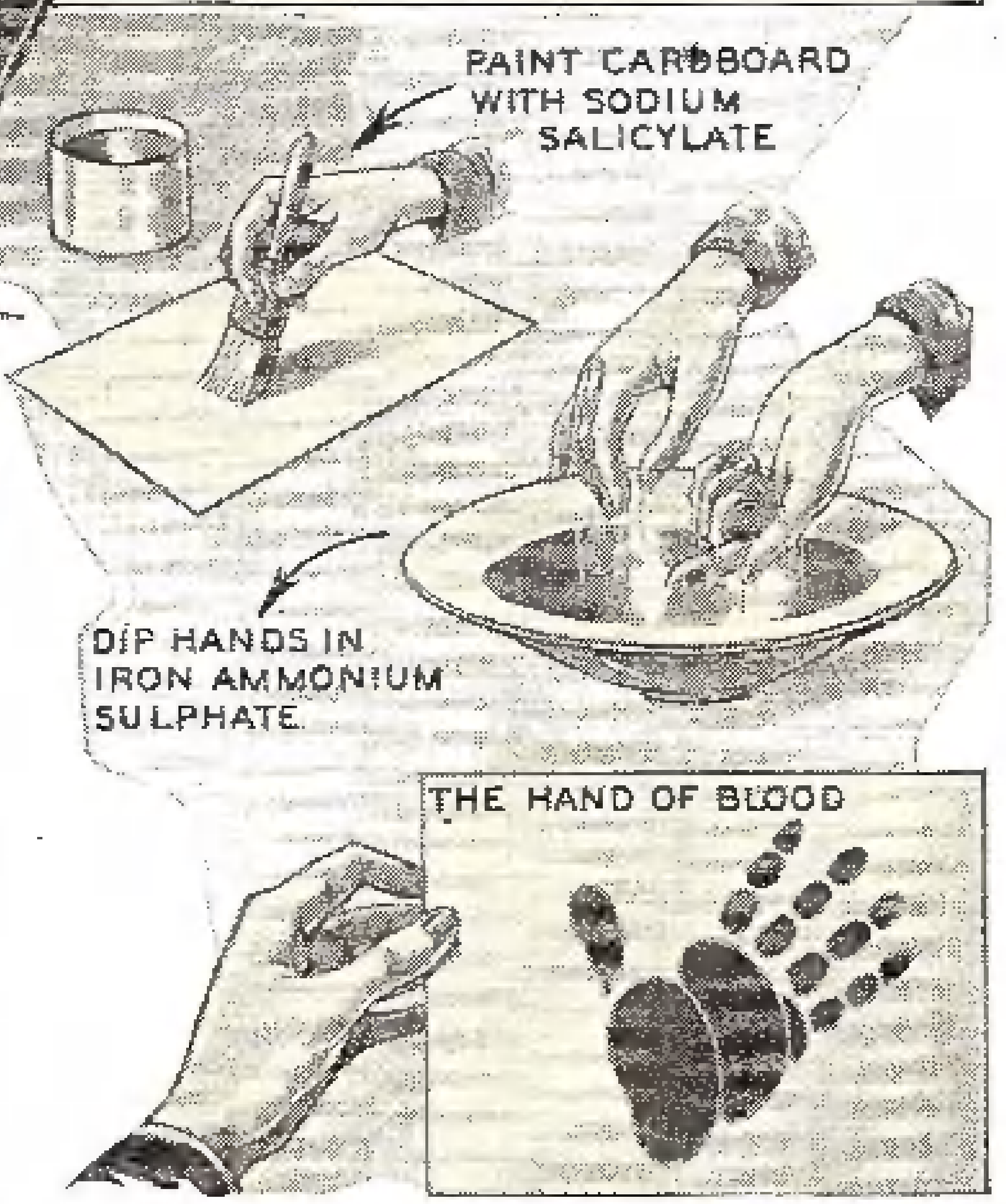

ANGLE IRON BRACE
STRAP IRON BRACE

Another view of trailer frame, showing how steel braces from beam to axle add rigidity to the suspension assembly.

Entertain Friends with These Pseudo-Occult Magic Tricks

A steel ball rolling around on paper over plate glass spells out "spirit" messages in a mystifying manner.


OPERATOR HIDDEN BEHIND CURTAIN
STEEL BALL
MAGNET UNDERNEATH GLASS
EXTENDED ARM
PANTOGRAPH


PAINT CARDBOARD WITH SODIUM SALICYLATE
DIP HANDS IN IRON AMMONIUM SULPHATE
THE HAND OF BLOOD

Performer washes hands in seemingly clear water, presses one hand on ordinary white cardboard, and bloody red imprint of human hand is immediately formed on cardboard.

by DICK COLE

ANYONE can display "supernatural" powers before a group of friends, put on a pseudo-occult demonstration which defies all natural laws, and call upon the "spirits" for advice and mystic messages.

In calling for spirit messages, the room is darkened, with only a weird blue light to cast grotesque shadows.

Trick Is Simple

In the center of the table is a sheet of paper over a square of plate glass, with a black steel ball resting on one corner.

Monotonously chanting mystic unintelligible words, the "medium" demands a message of the spirits, in answer to a query from someone in the audience.

As the spectators watch the ball, it quivers—moves—leaves a black trail in its wake! The trail forms letters—words—a message on the smooth glass!

The secret is this. First of all, the apparently solid steel ball is hollow. It is coated with lamp-black, which forms the trail of black on the glass.

Beneath the table is a powerful permanent or electro-magnet, supported by a pantograph arm which extends back through a hole in the curtain to the pantograph assembly on another table.

A confederate writes out the messages with the tracing point of the pantograph, and the moving magnet pulls the hollow steel ball around on the glass.

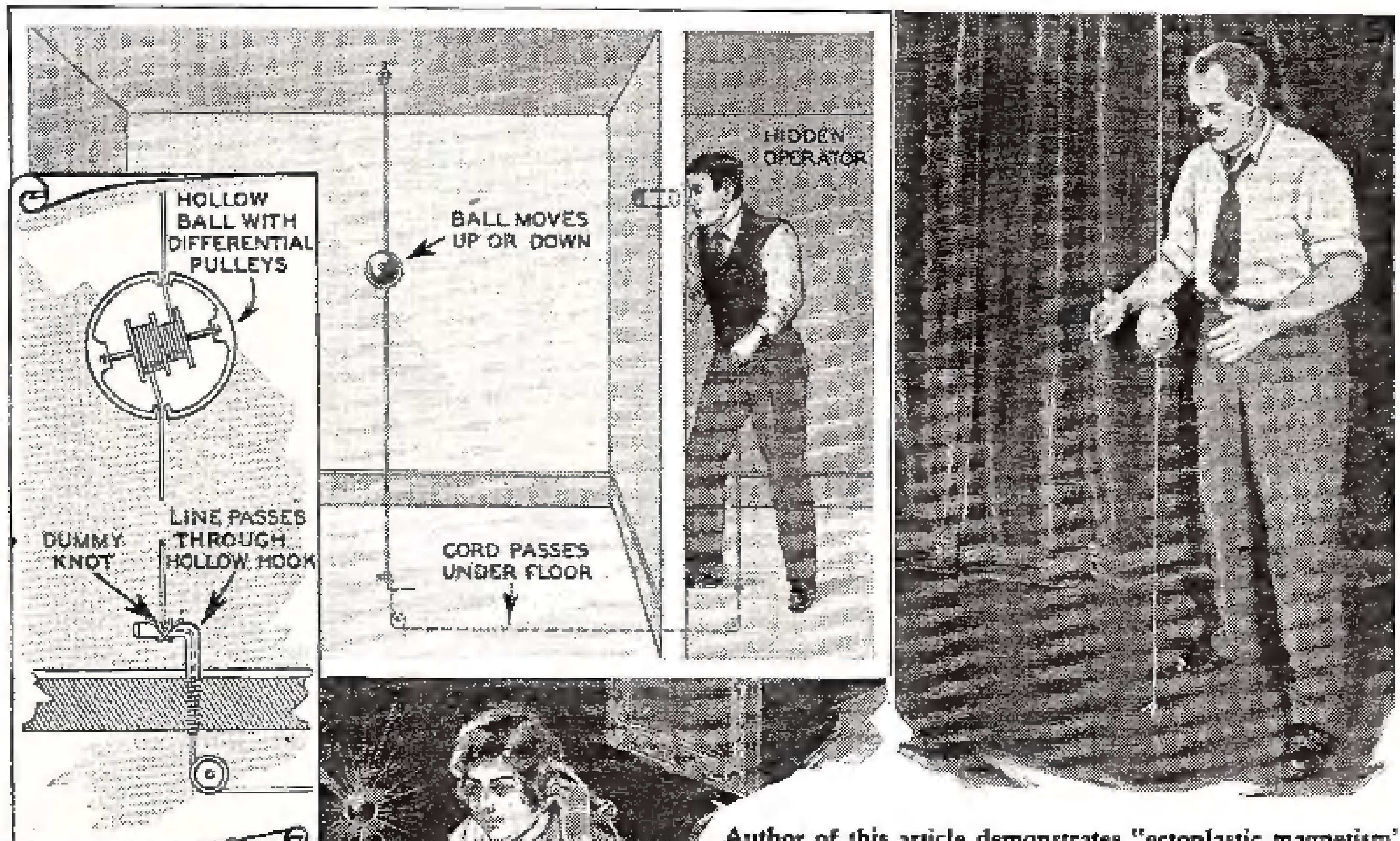
Ordinary wood laths can be used for the pantograph arms, the distances being easily determined for the desired size of writing after a few trial settings of the arms.

A popular East Indian Yogi trick is the "Hand of Blood." To prepare for this, paint or spray a piece of cardboard or cloth with a solution of sodium salicylate. Prepare a solution of iron-ammonium-sulphate.

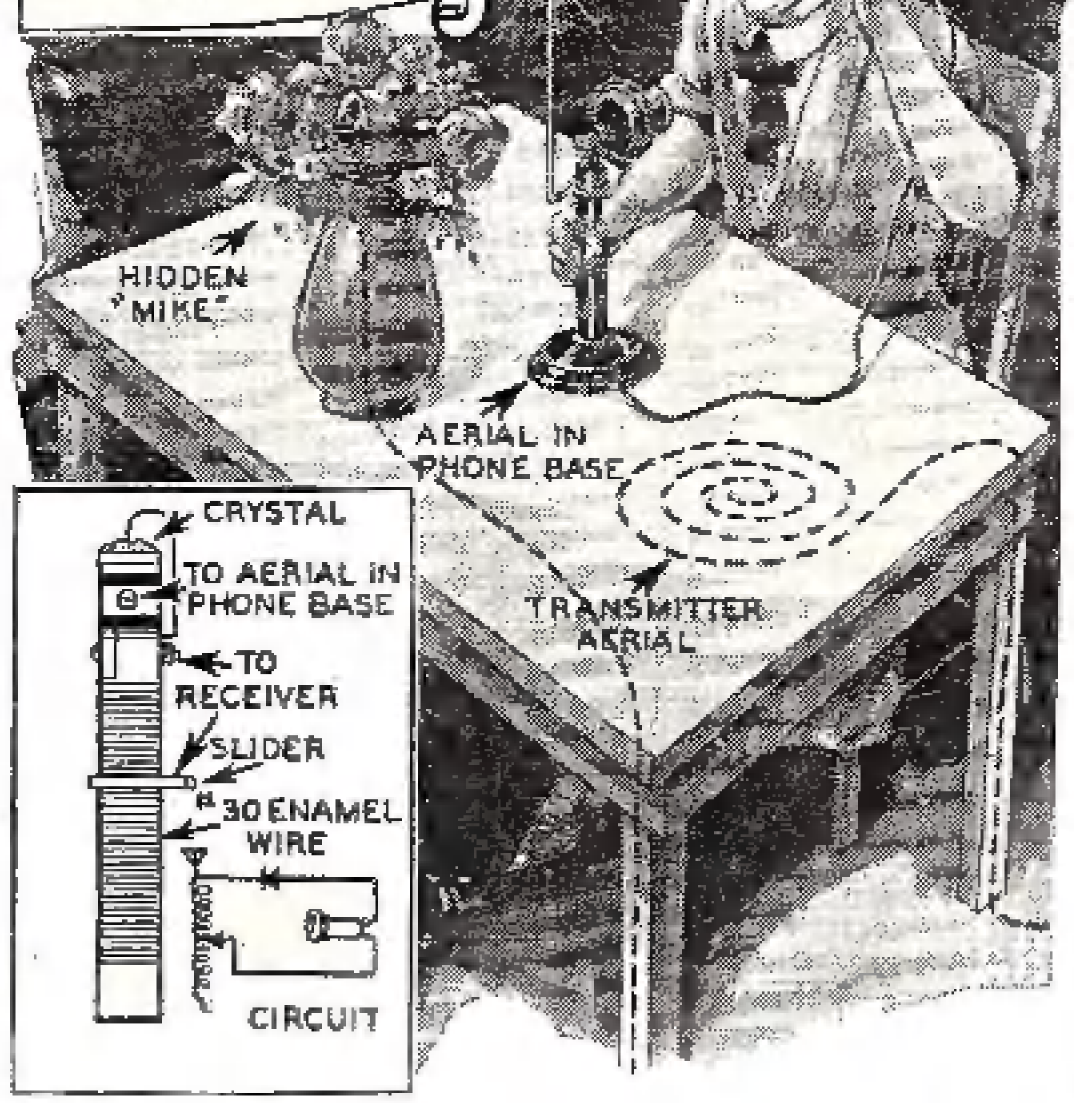
Show the cardboard to the audience to prove it has not been colored beforehand. Clean your hands of dirt by washing in the clear sulphate solution, and press one hand carefully on the cardboard.

The chemical on the hand, coming in contact with the treated cardboard, produces a deep red stain—an impression of a bloody human hand!

"Ectoplastic magnetism" can be demonstrated in a slightly darkened room. A shiny, chromium-plated ball about eight inches in diameter is threaded on a cord extending from ceiling to floor. The ball rests on the floor, but is free to slide up and down the string. The "medium" stoops and places her hands about six inches above the ball. Slowly raising her hands, the ball climbs up the cord in defiance of gravity.


HOLLOW BALL WITH DIFFERENTIAL PULLEYS
DUMMY KNOT
LINE PASSES THROUGH HOLLOW HOOK
BALL MOVES UP OR DOWN
CORD PASSES UNDER FLOOR
HIDDEN OPERATOR

Author of this article demonstrates "ectoplastic magnetism" by making massive steel ball climb up string in defiance of gravity. Sketches at left show how it is done. Confederate pulls gently on lower cord to make ball climb.


HIDDEN "MIKE"
AERIAL IN PHONE BASE
TRANSMITTER AERIAL
CRYSTAL
TO AERIAL IN PHONE BASE
TO RECEIVER
SLIDER
#30 ENAMEL WIRE
CIRCUIT

Wireless telephone for conversing with "spirits" is not at all mystifying to a radio fan. Crystal set, connected to receiver, is concealed in base of phone, using circuit shown above.

Ball Is Hollow

The mystic ball, seemingly of massive steel, is really a metal shell. The cord does not pass through the ball; each end is wound on a drum turning on a cross-shaft within. The drums are of different sizes, the lower cord winding on the larger drum.

The small leverage obtained here is sufficient to make the ball climb when the lower cord is pulled. This cord passes through a dummy knot on the hollow screw-eye, down through the floor to a remote point where a peeping confederate moves the ball in unison with the operator's hands.

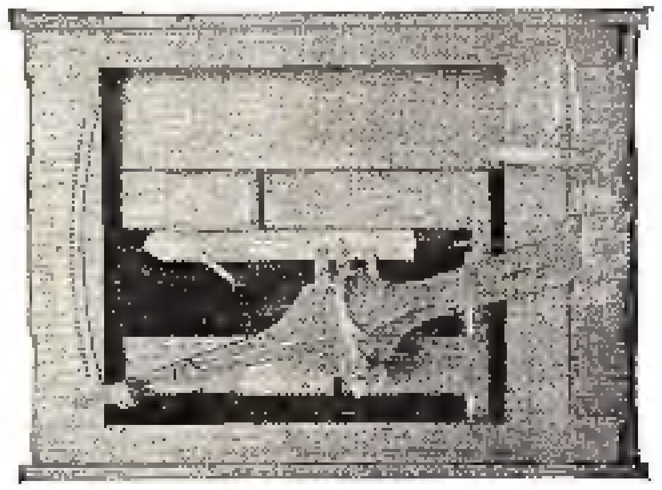
"Spirit messages" can be received over an ordinary telephone entirely disconnected from the line. A miniature crystal set, built into the body of the wireless telephone, is connected to the receiver.

The transmitter is located in another part of the house, and the sending aerial run up through the floor to the table.

A microphone concealed in a vase of flowers picks up the words spoken into the telephone and brings them to the "spirit."

THE FIRST FACTS *to* KNOW ABOUT A PATENT

An INVENTION



Model of the First Typewriter

An IMPROVEMENT

Improved Typewriter

The Difference Between "Improvement" and "Invention"

Very few inventions are entirely original. When a friend says of your inventive idea, "Oh, I'm sure something like that has been patented already," the chances are that it has. But your idea may have certain differences or improvements that earn its right to patent protection. The first step is to determine, through patent office search, if there are existing patents that bear on your idea.

THE FIRST STEP

First—secure an experienced Patent Attorney to look after your interests at Washington. It is not the part of wisdom to put-off or delay. And remember—U. S. Patent protection is the only way to obtain the exclusive right to manufacture, use, or sell your invention.

Importance of the "Search"

I can help you immediately. My offices are in Washington. Send your idea to me in rough form. My experienced examiners will make a search through the Patent Office to see if your invention has been anticipated. I can give you a report at once—and this is something you *must* have, because it decides what future steps you should take.

Models and Finished Drawings Unnecessary

Don't spend money or time on finished models or drawings before you know your idea may be patentable. My large staff of experienced patent searchers can handle a search from your description and roughest sketch. The main thing is to put it in my hands as promptly as possible.

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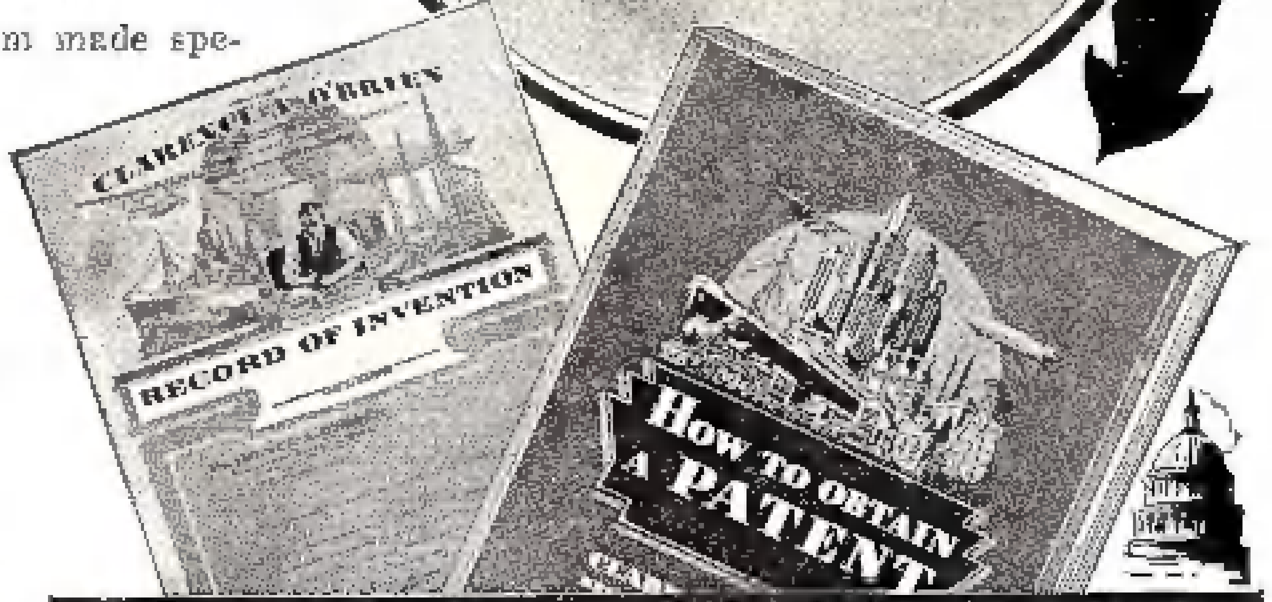
Shows How



CLARENCE A. O'BRIEN

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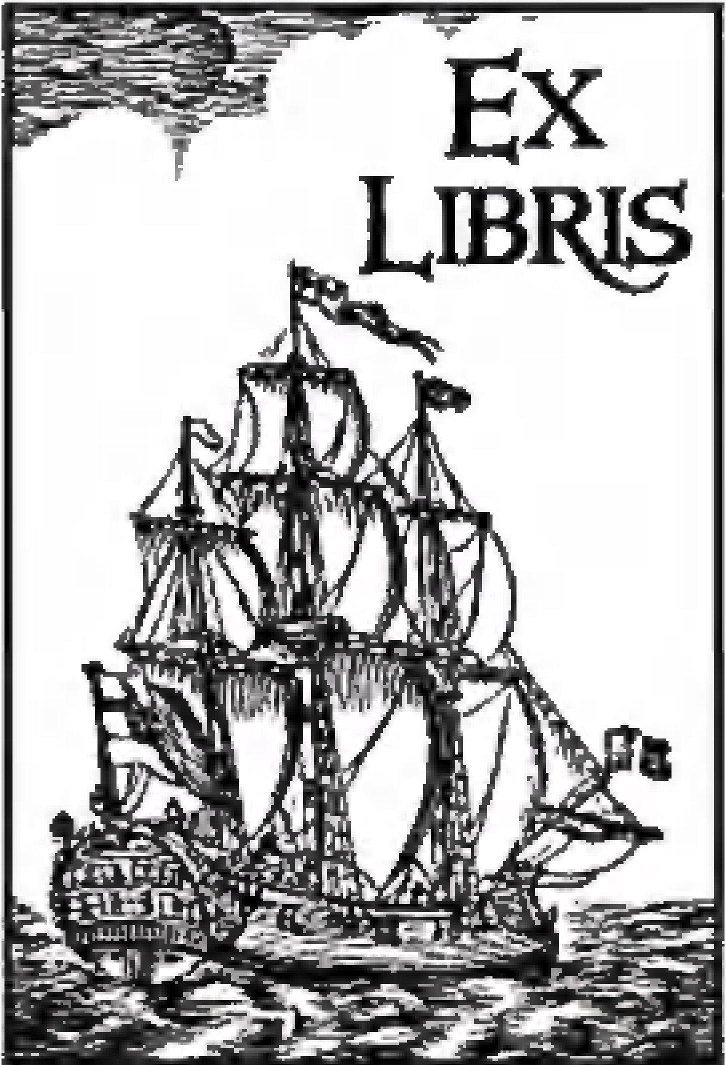

Anon. Malefactor